

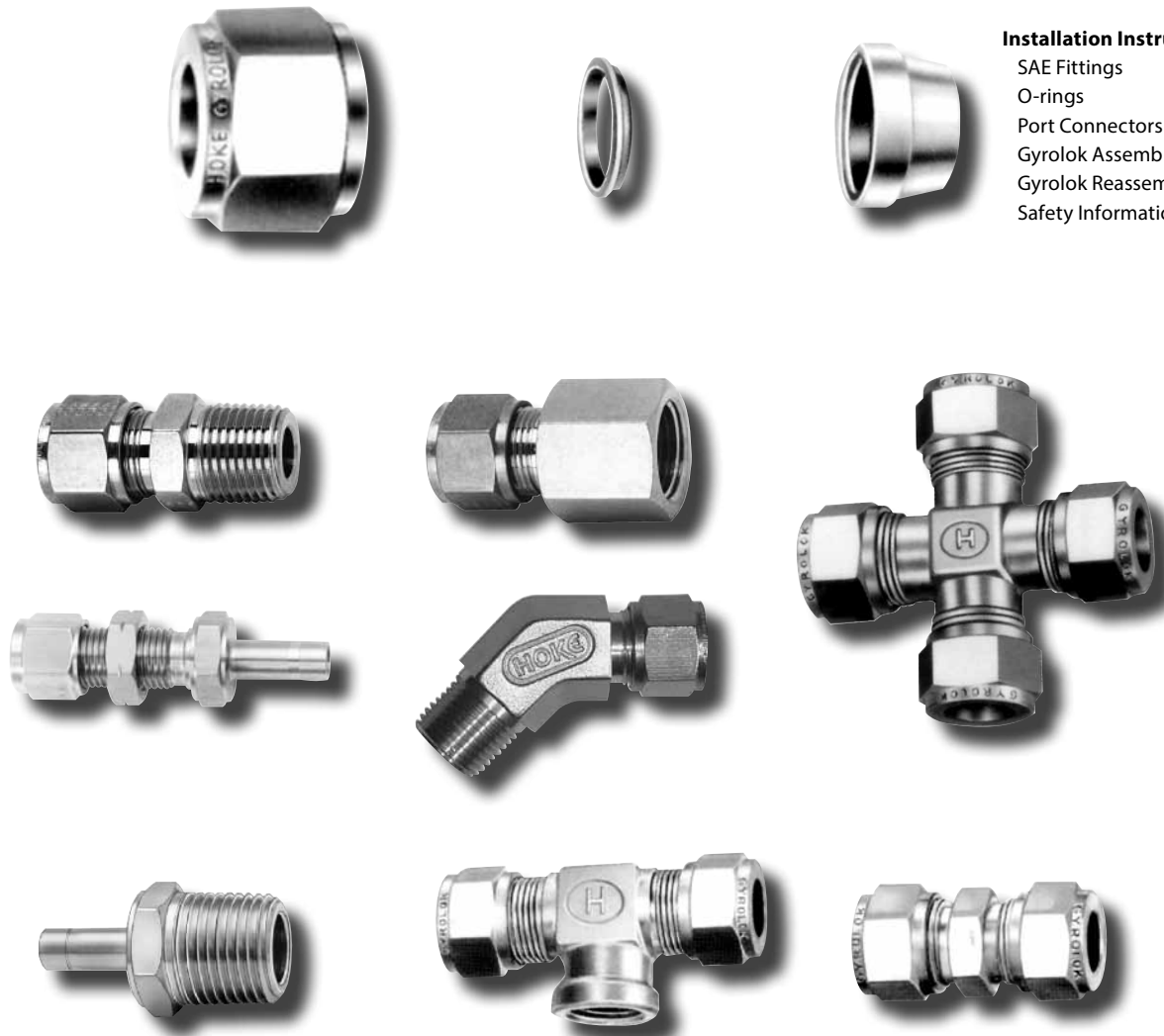


# GYROLOK® Tube Fittings

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GYROLOK®

**HOKE Inc.**  
 PO Box 4866 • Spartanburg, SC 29305-4866  
 Phone (864) 574-7966 Fax (864) 587-5608  
 www.hoke.com • Sales-hoke@circo.com



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## HOKE GYROLOK® Tube Fittings



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### *7 Decades of Product Excellence*

Samuel W. HOKE began manufacturing small gas flow control valves for jewelers' torches in 1925. At the same time, he also laid the foundation for a top international fluid control products company, HOKE Incorporated.

In the early 1940's, S.W. HOKE produced the forerunners of today's HOKE valves, masterfully crafted with the highest quality materials.

In the early 1960's, HOKE Incorporated (HOKE) took the industry by storm, introducing the HOKE **GYROLOK**® Tube Fitting. To this day, no other manufacturer has been able to improve upon its unique design.

Over the years, HOKE Incorporated built a first-class reputation for designing and manufacturing state-of-the-art products. In striving for maximum quality and value, HOKE set the industry standards for product safety, operability, durability and reliability.

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### *Training and Engineering Support*

HOKE offers extensive training designed to ensure that your craftspeople thoroughly understand how a HOKE **GYROLOK**® fitting functions. By teaching proper tubing preparation and installation procedures, maximum performance is assured.

HOKE will take the time to assist our customers in finding the HOKE **GYROLOK**® fitting that is right for their specific needs. Ask your HOKE distributor for details regarding HOKE's valve and fitting installation workshop and additional support materials.

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GYROLOK®

# Fitting Locator

To connect tubing to a female thread, use:



**CM Male Connector**  
fractional or metric tube to  
• NPT/RT threads  
Page 8



**CM/ Male Connector**  
fractional or metric tube to  
• RP/RS threads  
Pages 11, 12



**BCM Bulkhead Connector, Male**  
fractional or metric tube to  
• NPT Thread  
Page 9



**CMS Male Connector, SAE**  
fractional tube to  
• SAE/MS straight thread  
Page 9



**LCMS Long Male Connector, SAE**  
fractional tube to  
• SAE/MS straight thread  
Page 9



**COS O-ring Straight Connector**  
fractional tube to  
• O-ring straight thread  
Page 10



**COM O-ring Male Connector**  
fractional tube to  
• Female pipe thread  
Page 10



**LM Male Elbow**  
fractional or metric tube to  
• NPT thread  
• RT/RS/RP thread  
Pages 13, 14



**LMF 45° Male Elbow**  
fractional tube to  
• NPT thread  
Page 15



**LMFS 45° Positionable Male Elbow**  
fractional tube to  
• SAE/MS straight thread  
Page 15



**LMS Positionable Male Elbow**  
fractional or metric tube to  
• SAE/MS straight thread  
Page 15



**TTM Male Branch Tee**  
fractional or metric tube to  
• NPT thread  
Page 16



**TMT Male Run Tee**  
fractional or metric tube to  
• NPT thread  
Page 17



**TST Positionable Male Run Tee**  
fractional tube to  
• SAE/MS straight thread  
Page 17



**TTS Positionable Male Branch Tee**  
fractional or metric tube to  
• SAE/MS straight thread  
Page 17

To connect tubing to a male thread, use:



**CF Female Connector**  
fractional or metric tube to  
• NPT thread  
• RT/RG threads  
Pages 18, 19, 20



**BCF Bulkhead Connector, Female**  
fractional or metric tube to  
• NPT thread  
Page 21



**LF Female Elbow**  
fractional or metric tube to  
• NPT thread  
• RT thread  
Page 22



**TFT Female Run Tee**  
fractional or metric tube to  
• NPT thread  
Page 23



**TTF Female Branch Tee**  
fractional or metric tube to  
• NPT thread  
Page 23

To connect two or more tubes together, use:



**U Union**  
fractional or metric tube  
Page 24



**RU Reducing Union**  
fractional or metric tube  
Pages 25



**BU Bulkhead Union**  
fractional or metric tube  
Page 26



**LU Union Elbow**  
fractional or metric tube  
Page 27



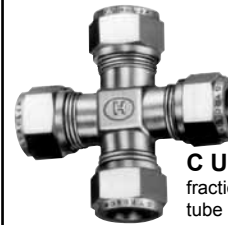
**TTT Union Tee**  
fractional or metric tube  
Page 27



**TTT\_B Reducing Run Tees**  
fractional tube  
Page 28



**TTTB Reducing Branch Tees**  
fractional or metric tube  
Page 28



**C Union Cross**  
fractional or metric tube  
Page 29

To connect tubing to a 37° flare, use:



**UAN Union, AN**  
fractional tube to AN  
• flared tube  
Page 30



**UANO Union, AN O-ring**  
fractional tube to O-ring AN  
• flared tube  
Page 30



**BUAN Bulkhead Union, AN**  
fractional tube to AN  
• flared tube  
Page 30



**AAN Adapter, AN**  
AN to GYROLOK® port  
• flared tube  
Page 31

**To connect tubing to a welded system, use:**



**CW Tube Socket Weld Connector**  
fractional tube  
Page 31



**LW Tube Socket Weld Elbow**  
fractional tube  
Page 31



**CBW Butt Weld Connector**  
fractional or metric tube to pipe  
Page 32



**LBW Butt Weld Elbow**  
fractional or metric tube to pipe  
Page 32

**To reduce fitting size, use:**



**R Reducer**  
fractional or metric tube  
Pages 33, 34

**To connect tube fittings together, use:**

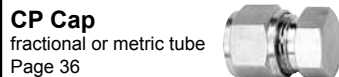


**PC Port Connector**  
fractional or metric tube  
Page 35

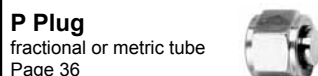


**PC Reducing Port Connector**  
fractional or metric tube  
Page 35

**To cap a tube or plug a fitting, use:**



**CP Cap**  
fractional or metric tube  
Page 36

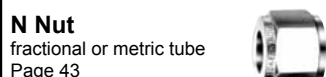


**P Plug**  
fractional or metric tube  
Page 36

**As spare parts, use:**



**FR & FF Rear and Front Ferrules**  
fractional or metric tube  
Page 43  
*Front and back ferrules available in nylon, page 43*



**N Nut**  
fractional or metric tube  
Page 43



**KN Knurled Nut**  
fractional tube  
Page 44



**BN Bulkhead Nut**  
fractional or metric tube  
Page 44



**SCNF Safety Changer Nut & Ferrule Sets**  
fractional or metric  
Page 44



**SCF Safety Changer Ferrule Sets**  
fractional or metric  
Page 44

**For specific applications, use:**



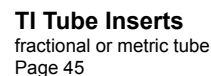
**CMT Male Thermocouple Connector**  
Page 37



**Chromatography Fittings**  
fractional tube  
Pages 48, 49



**CLF Lapped Joint Flange Connector**  
fractional or metric tube  
Page 46



**TI Tube Inserts**  
fractional or metric tube  
Page 45



**XT Heat Exchanger Tee**  
Page 38



**DU, DCM Dielectric Fittings**  
fractional or metric  
Page 44



**Calibration Fittings**  
fractional tube  
Page 46

**Tools & Accessories**



**GG Gyrogage**  
fractional or metric  
Page 50



**PST Pre-setting Tool**  
Page 51



**LD Leak Detective**  
Page 51



**HPST Hydraulic Pre-set Tool**  
Page 52

**GYROLOK® Adapters**



**AM/ Male Adapter**  
fractional or metric tube to  
• NPT thread  
• RT thread  
Page 39



**AM/ Male Adapter**  
fractional or metric tube to  
• RT, RS, RG threads  
Page 40



**AOS O-ring Straight Adapter**  
fractional tube to  
• female straight thread  
Page 40



**AMS Adapter, SAE**  
fractional tube to  
• SAE/MS straight thread  
Page 40



**BA Bulkhead Adapter**  
fractional or metric tube  
Page 34

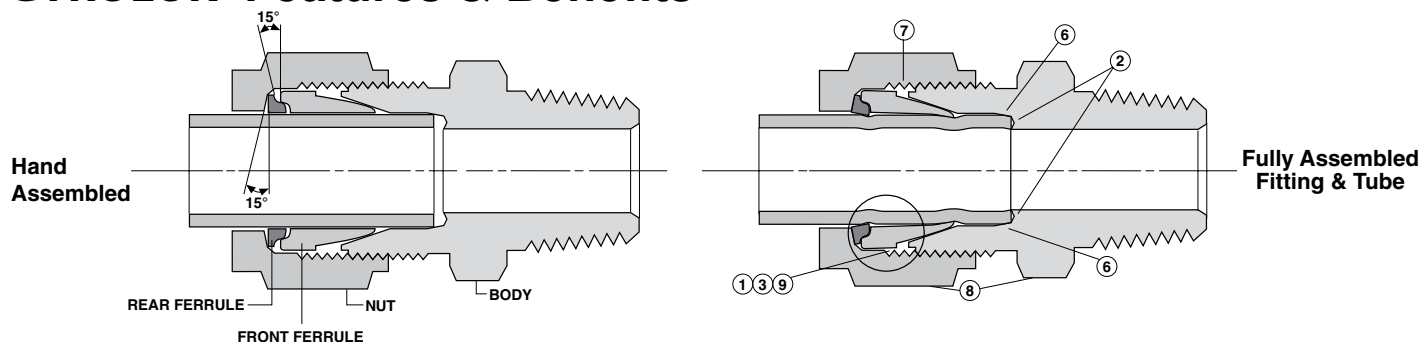


**AOM Male Adapter**  
fractional or metric tube to  
• female pipe thread  
Page 40



**AF Female Adapter**  
fractional or metric  
• NPT thread  
• RT, RG threads  
Pages 41, 42

# GYROLOK® Features & Benefits



FEATURES	EXPLANATION	BENEFITS
<b>1. CONTROLLED FERRULE DRIVE</b>	Roll-in locking action of rear ferrule: During fitting makeup, 15° angles close — between the rear ferrule and nut, and between the rear ferrule and front ferrule — thus preventing overstressing of tubing or excessively reducing tubing inside diameter. Front ferrule shoulder: Front ferrule shoulder prevents body expansion and nut jamming, caused by over-tightening.	Provides maximum user safety under high pressure/vibration conditions. Prevents overstressing, which causes tubing failure and possible injury. System efficiency is improved by maximizing flow. Provides unmatched remake life. Maximizes value and economy.
<b>2. BUTT SEAL</b>	Provides a secondary seal and eliminates dead space.	Maximizes fitting leak integrity and user safety. Can seal with scratched tubing. Increases accuracy in sampling applications. Reduces pump-down time in vacuum applications.
<b>3. HOKE VALVES WITH INTEGRAL HOKE GYROLOK® END FITTINGS</b>	Controlled ferrule drive prevents end connection expansion, thus prolonging valve life and eliminating the need to use female-ended valves with separate fittings. Eliminates a possible leak path and extends valve life.	Long product life and maximum value. Safety and economy.
<b>4. GYROLOK® SAFETY CHANGER NUT AND FERRULE SETS</b>	Nut and ferrule sets supplied on rods, already correctly oriented. (Not necessary to handle ferrules when replacing components.)	Safest, simplest device for component replacement.
<b>5. GYROGAGE</b>	Marks tubing to show that tubing has been properly inserted into fitting, and that fitting has been properly tightened.	Maximum safety resulting from ability to verify correct tube insertion and proper tightening.
<b>6. SIZING ANGLE</b>	Slight taper in the base of the tube socket reduces possibility of tube sticking	Less tube sticking during disassembly saves time and money
<b>7. SILVER-PLATED NUT THREADS</b>	Silver-plating extends fitting life by preventing galling, up to 1200° F.	Extended product life at extreme temperatures.
<b>8. MATERIAL TRACEABILITY ON FITTING BODY AND NUT</b>	Bodies and nuts made of 316 Stainless Steel and Monel are heat code traceable to Certified Material Test Reports.	Traceability provides added safety. Certified Material Test Reports are available for review and verification.
<b>9. PFA FERRULE COATING</b>	Front ferrules—Sizes larger than 1" (25mm) are PFA coated.	Increased resistance to media and atmospheric corrosion.
<b>10. SPECIAL HIGH TOLERANCE NPT THREAD</b>	ANSI Standard B1.20.1 - Basic + 1/4 to Basic +1.	Provides a Safer more robust connection: 63% tighter tolerance with up to six thread engagement, reduced galling and vibration

# The HOKE GYROLOK® Design

HOKE **GYROLOK®** Tube Fittings have been carefully designed and manufactured to provide outstanding leak-tight integrity in a wide range of applications.

## Materials

HOKE **GYROLOK®** fittings are available in:

Brass:	BR
304 Stainless Steel:	304/304L
316 Stainless Steel:	316/316L
Monel:	M
Hastelloy® C-276:	HC
Duplex 2205:	DX3
Inconel Alloy:	625
Inconel Alloy:	825
Super Duplex 2507:	D50
Titanium:	TI
254 SMO:	6MO
316/316L SS Forgings:	ASTM A-182/SA182
304/304L SS Forgings:	ASTM A-182/SA182
Brass Bar Stock, Alloy 360:	ASTM B-16
316/316L SS Bar Stock:	ASTM A-479/SA479
304/304L SS Bar Stock:	ASTM A-479/SA479
Monel Forgings, Alloy 400:	QQ-N-281
Brass Forgings, Alloy 377: ASTM B-283	QQ-B-626
Monel Bar Stock, Alloy 405:	QQ-N-281
Brass Bar Stock, Alloy 353:	ASTM B-453

Contact your local HOKE distributor for further information.

## Certified Material Text Reports (CMTRs)

Bodies and nuts of HOKE **GYROLOK®** fittings in all materials other than Brass are heat code traceable. To obtain CMTRs for these components, place separate orders for such items and specify "CMTRs required on all items".

## Pressure Rating

HOKE **GYROLOK®** fitting ends are rated for working pressures higher than the tubing recommended for use with HOKE **GYROLOK®**. Under no circumstances should tubing should be utilized at pressures above its maximum allowable working pressure. Refer to the HOKE Tubing Data Charts for specific information. If no pressure is identified for a given tube size and tube wall thickness, that tubing is not considered suitable for use with **GYROLOK®** tube fittings. Pressure ratings may vary for the other fitting end if it is not **GYROLOK®** (i.e. NPT or O-Ring Seal). For general working pressure ratings for NPT fittings ends, refer to the HOKE Pipe Fittings catalog. The user must determine whether both the **GYROLOK®** side and the non-**GYROLOK®** side working pressure ratings are suitable with the system pressure. For more information on **GYROLOK®** pressure ratings, contact your local distributor, or HOKE directly.

## PFA Coating

Stainless steel front ferrules larger than 1" and 25 mm are PFA coated.

## Vacuum Rating

HOKE **GYROLOK®** offers deep vacuum capability. With good quality tubing, HOKE **GYROLOK®** fittings will be leak-tight at vacuum levels of 10<sup>-6</sup> torr while tested with a leakage sensitivity of 10<sup>-9</sup> scc

## Temperature

HOKE **GYROLOK®** fittings provide safe, reliable performance from cryogenic temperatures to high temperature bake out levels, depending on material.

316 Stainless Steel: -325° F to +800° F  
(-200° C to +426° C)\*

Stainless steel front ferrules larger than 1" and 25mm are PFA coated. Applications above 450° F (232° C) require silver-plated front ferrules and uncoated rear ferrules. To order extended temperature fittings, add -HT to the basic part number.

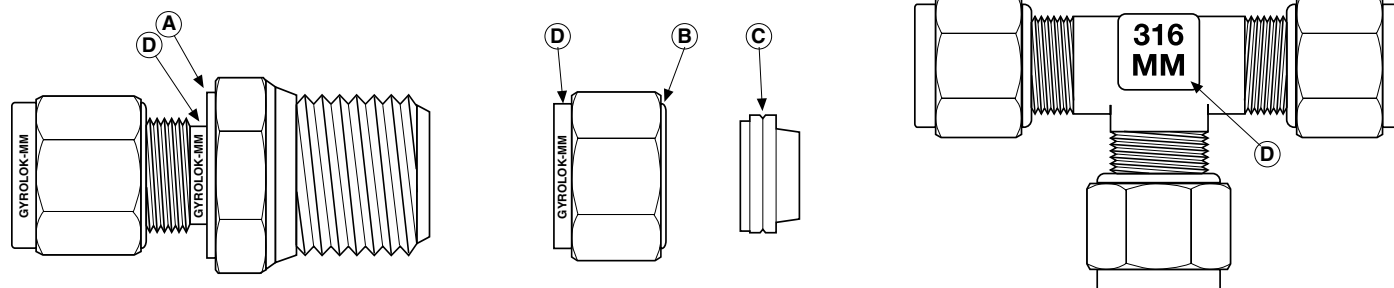
Brass (copper tubing): -325° F to +400° F  
(-200° C to +203° C)

Monel: -325° F to +800° F  
(-200° C to +426° C)

## \* CAUTION: (for Stainless Steel):

Intermittent use to 1200° F (649° C) is possible, however prolonged exposure to temperatures over 800° F (426° C) is not recommended.

## Identifying Metric GYROLOK® Products



HOKE metric **GYROLOK®** products have certain features which allow you to identify them from fractional products.

### A. Step Machined on Body Hex

Straight bodies with a metric **GYROLOK®** end have a step on the tube fitting side of the hex.

### B. Short Shank on Nut

Metric nuts have a short shank on the threaded end.

### C. Groove in Front Ferrule

Metric front ferrules of brass or 316 stainless steel have a groove in the shoulder. For other materials, see D.

### D. MM Marking

The metric designation "MM" is stamped on:

- metric nuts and straight bodies—after the **GYROLOK®** trademark
- metric elbows, tees and crosses—on the side opposite the HOKE logo
- front ferrules made from materials other than brass or 316 stainless steel—after material identification.

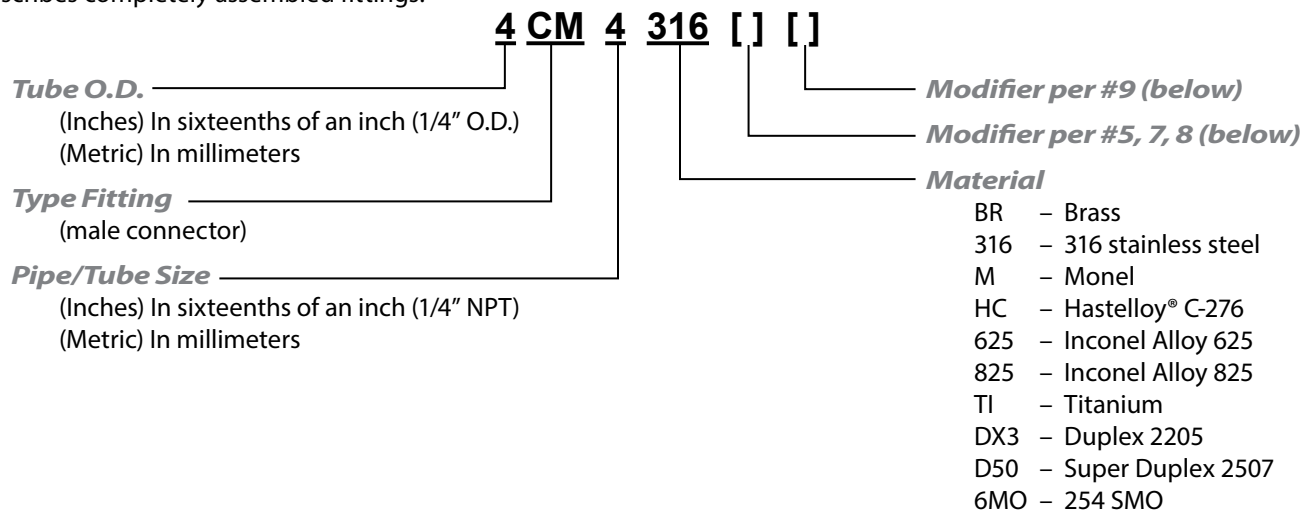
### Color Coding

Blue boxes designate metric parts and accessories, including Safety Changer packaging and Gyrogages.

# General Information

## How to Order

The HOKE **GYROLOK**® numbering system is a completely descriptive system that's easy to understand. Each part number describes completely assembled fittings.



1. The first number (4) identifies the tube O.D. size. For example, 4 = 4/16" for fractional fittings. 4 = 4mm for metric fittings. If there is no 5<sup>th</sup> group, sizes are fractional.
2. The letter group, (CM) identifies the type of fitting (Male Connector). See fitting locator, pages 2 and 3.
3. The third group, a number (4), is only necessary if the second tube connection size is different from the first tube O.D. size. For pipe sizes, a number is always required.
4. Material is identified in the fourth group.
5. With the exception of branch tees, the fifth group, if present, contains two letter codes. The first letter designates the unit of measure for the first number in the part number—i.e, E for fractional, M for metric. The second letter indicates the unit of measure (E or M), or thread type, for the second number in the part number. If there is no 5<sup>th</sup> group, all sizes are fractional.

Examples:

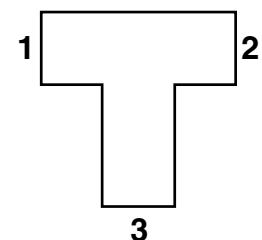
4CM4 316 = 1/4 tube x 1/4 NPT male connector, 316 stainless steel

6RU3 BR ME = 6mm tube x 3/16 tube reducing union, brass

8LM4 316 EC = 1/2 tube x 1/4 male RT, male elbow, 316 stainless steel

### Unit of measure/end connector codes:

A = RS male ends	M = Metric tube, in millimeters
B = RP male ends	X = RS/RP female ends
C = RT ends	Z = RG female ends
E = fractional unit of measure in 1/16 <sup>th</sup> of an inch	



6. Tee part numbering: TEES are described by first the run (1 and 2) and next the branch (3), for example:
  - TTM describes a tee that has tube connections at 1 and 2 and a male pipe thread at position 3.
  - TFT describes a tee that has tube connections at 1 and 3 and a female pipe thread at position 2.
7. Fittings cleaned for oxygen service: To order, add HPS 18 to the end of basic fitting part number.  
Example: 4CM4 316 HPS 18
8. Fittings cleaned for nuclear service: To order, add HPS 90 to the end of basic fitting part number.  
Example: 4CM4 316 HPS 90
9. O-ring designator - Viton® (45) is standard for SAE fittings. In the event no material is specified, Viton will be supplied. Buna (21) is standard for other fittings with O-rings. Alternative O-ring materials are available, including silicone (01), and Buna-N (23). Example 6CMS631623

# Thread Connections Available with GYROLOK® Fittings

## Pipe Thread Information

HOKE **GYROLOK**® tube fittings are available with NPT (National Pipe Taper), BSP/ISO (British Standard Pipe/International Standards Organization), SAE or unified screw threads.

### Tapered Threads

Specifications	Type	Part Number or Suffix Designation	Sealing Method
NPT	M/F	Fitting type ends in M or F, as in CM or CF	Seal is made on the thread. Thread sealant is required.
RT to ISO 7/1 • BS 21 • JIS B0203 • DIN 2999	M/F	Modifier is C, following the unit of measure for fractional (E) or metric (M), as in 6CM4316EC	Seal is made on the thread. Thread sealant is required. The BSP/ISO thread utilizes a different angle and the number of threads per inch may differ from NPT. Reference DIN 3852, Form C.
	M/F		
	M/F		
	Male		

#### FOR YOUR SAFETY

IT IS SOLELY THE RESPONSIBILITY OF THE SYSTEM DESIGNER AND USER TO SELECT PRODUCTS SUITABLE FOR THEIR SPECIFIC APPLICATION REQUIREMENTS AND TO ENSURE PROPER INSTALLATION, OPERATION AND MAINTENANCE OF THESE PRODUCTS. MATERIAL COMPATIBILITY, PRODUCT RATINGS AND APPLICATION DETAILS SHOULD BE CONSIDERED IN THE SELECTION. IMPROPER SELECTION OR USE OF PRODUCTS DESCRIBED HEREIN CAN CAUSE PERSONAL INJURY OR PROPERTY DAMAGE.

### Straight and Parallel Threads

Specifications	Type	Part Number or Suffix Designation	Sealing Method
American Standard unified screw threads	Male	Fitting type ends in S, as in COS or AOS.	Generally utilizes an elastomer o-ring to provide sealing.
RP to ISO 228/1 • BS 2779 • JIS B0202	Male	Modifier is B, following the unit of measure for fractional (E) or metric (M), as in 6CM4316EB	Metal to metal sealing to DIN 3852, Form B.**
RS to ISO 228/1 • BS 2779 • JIS B0202	Male	Modifier is A, following the unit of measure for fractional (E) or metric (M), as in 6CM4316EA	Utilizes a sealing washer to provide sealing. Reference DIN 3852, Form A.**
RG to ISO 228/1 • BS 2779 • JIS B0202	Female	Modifier is Z, following the unit of measure for fraction (E) or metric (M), as in 6CF4316EZ	Sealing form meets DIN 16288, Form Z.

\*\* Female RP or RS end available with Form X.

## HOKE GYROLOK® Fittings with SAE Ends

### SAE Straight Thread O-Ring Seal Fittings

HOKE **GYROLOK**®'s SAE Straight Thread O-Ring Seal Fittings are designed and manufactured to SAE standards defined below for use in many different applications including hydraulics and natural gas vehicles. HOKE's SAE Straight Thread O-Ring Fittings are supplied with Viton O-rings.

Fittings available include: Tube to SAE straight connectors, positionable SAE elbows and tees, and SAE reducers.

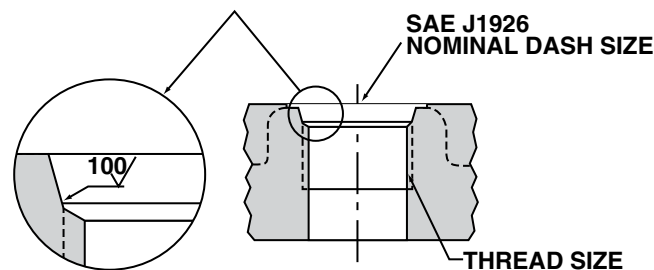
### Thread and O-ring Sizes

Nominal Tube O.D.	Port Size	Thread Size	O-ring Size #
1/8	2	5/16 - 24	902
1/4	4	7/16 - 20	904
3/8	6	9/16 - 18	906
1/2	8	3/4 - 16	908
5/8	10	7/8 - 14	910
3/4	12	1 1/16 - 12	912
1	16	1 5/16 - 12	916

### SAE Specifications

HOKE's SAE Straight Thread O-Ring Seal Fittings are designed and manufactured to meet SAE Standards as follows:

- Male or External Fitting End Dimensions: SAE J514
- Straight Threads: SAE J475 (equivalent to ANSI B1.1 or ISO R725)
- Female or Internal Straight Thread Boss: SAE J1926 (see diagram below)



### Installation Instructions

#### Positionable End Connections

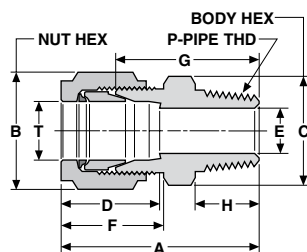
1. Assure that the locknut is fully raised.
2. Turn the external SAE end clockwise into the internal boss until the metal washer is in contact with the boss.
3. Orient the **GYROLOK**® end to the proper direction by now turning the fitting *counterclockwise* up to a *maximum* of 1 turn.
4. While supporting the body wrench pad with a backup wrench, tighten the locknut until the washer is snug against the face of the boss.

**GYROLOK**® Assembly Instructions, see page 53.



### Male Connector: CM, CM/EC

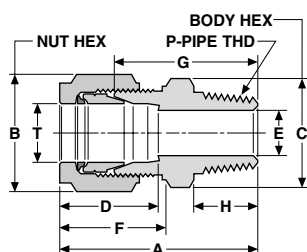
connects **fractional** tube to female NPT or RT threads



Part Number*		Dimensions — inches											
NPT Threads	RT Threads	T Tube O.D.	P NPT Size	A	B Hex Flat		C Hex Flat		D	E	F	G	H
1CM1[ ]	—	1/16	1/16	.97	5/16	5/16	.41	.05	.48	.75	.38		
1CM2[ ]	—	1/16	1/8	1.03	5/16	7/16	.41	.05	.48	.81	.38		
1CM4[ ]	—	1/16	1/4	1.22	5/16	9/16	.41	.19	.48	1	.56		
2CM1[ ]	—	1/8	1/16	1.19	7/16	7/16	.56	.09	.67	.88	.38		
2CM2[ ]	2CM2[ ]EC	1/8	1/8	1.22	7/16	7/16	.56	.09	.67	.91	.38		
2CM4[ ]	2CM4[ ]EC	1/8	1/4	1.44	7/16	9/16	.56	.09	.67	1.13	.56		
3CM2[ ]	—	3/16	1/8	1.27	1/2	7/16	.59	.13	.70	.95	.38		
3CM4[ ]	3CM4[ ]EC	3/16	1/4	1.50	1/2	9/16	.59	.13	.70	1.19	.56		
4CM1[ ]	—	1/4	1/16	1.33	9/16	1/2	.64	.10	.77	1	.38		
4CM2[ ]	4CM2[ ]EC	1/4	1/8	1.33	9/16	1/2	.64	.19	.77	1	.38		
4CM4[ ]	4CM4[ ]EC	1/4	1/4	1.58	9/16	9/16	.64	.19	.77	1.25	.56		
4CM6[ ]	4CM6[ ]EC	1/4	3/8	1.58	9/16	11/16	.64	.19	.77	1.25	.56		
4CM8[ ]	4CM8[ ]EC	1/4	1/2	1.80	9/16	7/8	.64	.19	.77	1.47	.75		
4CM12[ ]	—	1/4	3/4	1.83	9/16	1 1/16	.64	.19	.77	1.50	.75		
6CM2[ ]	6CM2[ ]EC	3/8	1/8	1.45	11/16	5/8	.72	.19	.83	1.09	.38		
6CM4[ ]	6CM4[ ]EC	3/8	1/4	1.64	11/16	5/8	.72	.30	.83	1.28	.56		
6CM6[ ]	6CM6[ ]EC	3/8	3/8	1.64	11/16	11/16	.72	.30	.83	1.28	.56		
6CM8[ ]	6CM8[ ]EC	3/8	1/2	1.86	11/16	7/8	.72	.28	.83	1.50	.75		
6CM12[ ]	—	3/8	3/4	1.86	11/16	1 1/16	.72	.30	.83	1.50	.75		
8CM2[ ]	—	1/2	1/8	1.56	7/8	13/16	.97	.19	.92	1.09	.38		
8CM4[ ]	8CM4[ ]EC	1/2	1/4	1.78	7/8	13/16	.97	.30	.92	1.31	.56		
8CM6[ ]	8CM6[ ]EC	1/2	3/8	1.78	7/8	13/16	.97	.41	.92	1.31	.56		
8CM8[ ]	8CM8[ ]EC	1/2	1/2	1.97	7/8	7/8	.97	.42	.92	1.50	.75		
8CM12[ ]	8CM12[ ]EC	1/2	3/4	2	7/8	1 1/16	.97	.42	.92	1.53	.75		
8CM16[ ]	—	1/2	1	2.19	7/8	1 3/8	.97	.42	.92	1.72	.94		
10CM6[ ]	—	5/8	3/8	1.78	1	15/16	1	.41	.92	1.34	.56		
10CM8[ ]	10CM8[ ]EC	5/8	1/2	1.97	1	15/16	1	.50	.92	1.53	.75		
10CM12[ ]	—	5/8	3/4	2	1	1 1/16	1	.50	.92	1.56	.75		
12CM8[ ]	—	3/4	1/2	2.08	1 1/8	1 1/16	1	.42	.97	1.63	.75		
12CM12[ ]	—	3/4	3/4	2.08	1 1/8	1 1/16	1	.66	.97	1.63	.75		
12CM16[ ]	—	3/4	1	2.39	1 1/8	1 3/8	1	.66	.97	1.94	.94		
14CM12[ ]	—	7/8	3/4	2.08	1 1/4	1 3/16	1.06	.72	.97	1.64	.75		
16CM8[ ]	—	1	1/2	2.36	1 1/2	1 3/8	1.31	.50	1.08	1.78	.75		
16CM12[ ]	—	1	3/4	2.36	1 1/2	1 3/8	1.31	.72	1.08	1.39	.75		
16CM16[ ]	—	1	1	2.55	1 1/2	1 3/8	1.31	.88	1.08	1.97	.94		
20CM16[ ]	—	1 1/4	1	3.04	1 7/8	1 3/4	1.62	.90	1.53	2.17	.94		
20CM20[ ]	—	1 1/4	1 1/4	3.04	1 7/8	1 3/4	1.62	1.10	1.53	2.17	.94		
24CM24[ ]	—	1 1/2	1 1/2	3.50	2 1/4	2 1/8	1.97	1.30	1.78	2.43	1.03		
32CM32[ ]	—	2	2	4.47	3	2 3/4	2.66	1.80	2.47	3	1.06		

### Male Connector: CM/ME, CM/MC

connects **metric** tube with NPT or RT tapered threads



Part Number*		Dimensions — mm											
NPT Threads	RT Threads	T Tube O.D.	P Pipe Thd.	A	B Hex Flat		C Hex Flat		D	E	F	G	H
3CM2[ ]ME	3CM2[ ]MC	3	1/8	32.3	11.1	11.1	14.3	2.2	17.1	24.4	9.5		
3CM4[ ]ME	3CM4[ ]MC	3	1/4	37.1	11.1	14.3	14.3	2.2	17.1	29.1	14.3		
4CM2[ ]ME	4CM2[ ]MC	4	1/8	33.1	12.7	11.1	15.1	2.3	17.9	25.3	9.5		
4CM4[ ]ME	4CM4[ ]MC	4	1/4	38.0	12.7	14.3	15.1	2.3	17.9	30.2	14.3		
6CM2[ ]ME	6CM2[ ]MC	6	1/8	34.8	14.3	12.7	16.3	3.8	19.5	26.4	9.5		
6CM4[ ]ME	6CM4[ ]MC	6	1/4	39.5	14.3	14.3	16.3	3.8	19.5	31.2	14.3		
6CM6[ ]ME	6CM6[ ]MC	6	3/8	40.1	14.3	17.5	16.3	3.8	19.5	31.8	14.3		
6CM8[ ]ME	6CM8[ ]MC	6	1/2	45.7	14.3	22.2	16.3	3.8	19.5	37.3	19.1		
6CM12[ ]ME	6CM12[ ]MC	6	3/4	46.5	14.3	27.0	16.3	3.8	19.5	38.1	19.1		
8CM2[ ]ME	8CM2[ ]MC	8	1/8	35.6	15.9	14.3	16.7	4.6	19.1	27.6	9.5		
8CM4[ ]ME	8CM4[ ]MC	8	1/4	39.8	15.9	14.3	16.7	5.8	19.1	31.8	14.3		
8CM6[ ]ME	8CM6[ ]MC	8	3/8	39.8	15.9	17.5	16.7	5.8	19.1	31.8	14.3		
8CM8[ ]ME	8CM8[ ]MC	8	1/2	46.3	15.9	22.2	16.7	5.8	19.1	38.3	19.1		
8CM12[ ]ME	8CM12[ ]MC	8	3/4	46.5	15.9	27.0	16.7	5.8	19.1	38.9	19.1		
10CM2[ ]ME	10CM2[ ]MC	10	1/8	35.8	19.1	17.5	17.5	4.6	19.8	27.8	9.5		
10CM4[ ]ME	10CM4[ ]MC	10	1/4	40.5	19.1	17.5	17.5	7.0	19.8	32.5	14.3		
10CM6[ ]ME	10CM6[ ]MC	10	3/8	40.5	19.1	17.5	17.5	7.4	19.8	32.5	14.3		
10CM8[ ]ME	10CM8[ ]MC	10	1/2	46.1	19.1	22.2	17.5	7.9	19.8	38.1	19.1		
12CM4[ ]ME	12CM4[ ]MC	12	1/4	45.3	22.2	20.6	24.6	7.0	23.4	33.3	14.3		
12CM6[ ]ME	12CM6[ ]MC	12	3/8	45.3	22.2	20.6	24.6	9.9	23.4	33.3	14.3		
12CM8[ ]ME	12CM8[ ]MC	12	1/2	50.0	22.2	22.2	24.6	9.9	23.4	38.1	19.1		
12CM12[ ]ME	12CM12[ ]MC	12	3/4	50.8	22.2	27.0	24.6	9.9	23.4	38.9	19.1		
14CM4[ ]ME	14CM4[ ]MC	14	1/4	42.0	23.8	22.2	22.2	7.0	21.0	32.6	14.3		
14CM6[ ]ME	14CM6[ ]MC	14	3/8	42.0	23.8	22.2	22.2	9.9	21.0	32.6	14.3		
14CM8[ ]ME	14CM8[ ]MC	14	1/2	47.5	23.8	22.2	22.2	11.9	21.0	38.1	19.1		
15CM8[ ]ME	15CM8[ ]MC	15	1/2	48.4	23.8	22.2	22.2	12.7	21.8	38.1	19.1		
16CM6[ ]ME	16CM6[ ]MC	16	3/8	45.2	25.4	23.8	25.0	9.9	23.4	34.0	14.3		
16CM8[ ]ME	16CM8[ ]MC	16	1/2	50.0	25.4	23.8	25.0	12.7	23.4	38.9	19.1		
16CM12[ ]ME	16CM12[ ]MC	16	3/4	50.8	25.4	27.0	25.0	12.7	23.4	39.6	19.1		
18CM8[ ]ME	18CM8[ ]MC	18	1/2	51.1	28.6	27.0	25.4	12.7	24.6	41.2	19.1		
18CM12[ ]ME	18CM12[ ]MC	18	3/4	51.1	28.6	27.0	25.4	15.8	24.6	41.2	19.1		
20CM8[ ]ME	20CM8[ ]MC	20	1/2	55.5	31.8	30.2	31.0	11.9	27.0	41.7	19.1		
20CM12[ ]ME	20CM12[ ]MC	20	3/4	55.5	31.8	30.2	31.0	16.7	27.0	41.7	19.1		
22CM8[ ]ME	22CM8[ ]MC	22	1/2	52.8	31.8	30.2	27.0	12.7	24.6	41.6	19.1		
22CM12[ ]ME	22CM12[ ]MC	22	3/4	52.8	31.8	30.2	27.0	17.9	24.6	41.6	19.1		
22CM16[ ]ME	22CM16[ ]MC	22	1	62.0	31.8	34.9	27.0	17.9	24.6	50.8	23.8		
25CM12[ ]ME	25CM12[ ]MC	25	3/4	59.7	38.1	34.9	33.3	18.1	27.4	45.2	19.1		
25CM16[ ]ME	25CM16[ ]MC	25	1	65.4	38.1	34.9	33.3	21.7	27.4	51.0	23.8		
30CM16[ ]ME	—	30	1	78.2	50.8	47.6	38.0	22.3	41.2	55.6	24.9		
30CM20[ ]ME	—	30	1 1/4	77.9	50.8	46.0	37.8	27.6	41.0	55.6	23.9		
32CM16[ ]ME	—	32	1	80.1	50.8	47.6	42.3	22.3	42.9	56.7	24.9		
38CM16[ ]ME	—	38	1	89.5	60.3	55.6	49.4	22.3	49.5	61.7	24.9		
38CM20[ ]ME	—	38	1 1/4	89.2	60.3	55.6	49.4	28.6	49.5	61.7	24.9		
38CM24[ ]ME	—	38	1 1/2	91.6	60.3	55.6	49.4	33.9	49.5	64.0	26.2		

\* [ ] see page 6 for material specifications.

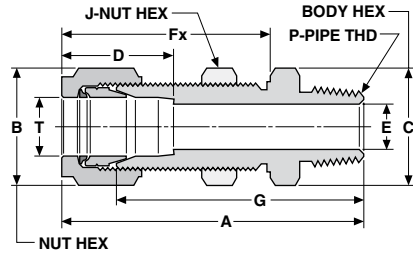
## Bulkhead Connector, Male: BCM

connects fractional tube to female NPT threads



Metric fitting shown

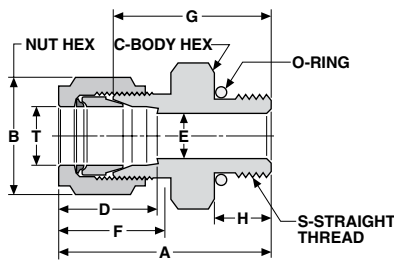
Part Number*	T P		Dimensions — inches								J	Panel Hole Size	Max. Panel Thickness
	Tube O.D.	Pipe Size	A	B Hex Flat	C Hex Flat	D	E	Fx	G				
2BCM2[ ]	1/8	1/8	1.88	7/16	1/2	.56	.09	1.28	1.56	1/2	.33	.44	
2BCM4[ ]	1/8	1/4	2.06	7/16	9/16	.56	.09	1.28	1.75	1/2	.33	.44	
3BCM2[ ]	3/16	1/8	1.91	1/2	9/16	.59	.13	1.31	1.59	9/16	.39	.47	
4BCM2[ ]	1/4	1/8	1.98	9/16	5/8	.64	.19	1.36	1.66	5/8	.45	.47	
4BCM4[ ]	1/4	1/4	2.17	9/16	5/8	.64	.19	1.36	1.84	5/8	.45	.47	
6BCM4[ ]	3/8	1/4	2.31	11/16	3/4	.72	.30	1.50	1.97	3/4	.58	.53	
6BCM6[ ]	3/8	3/8	2.33	11/16	3/4	.72	.30	1.52	1.97	3/4	.58	.53	
6BCM8[ ]	3/8	1/2	2.53	11/16	15/16	.7	.30	1.50	2.19	3/4	.58	.53	
8BCM6[ ]	1/2	3/8	2.56	7/8	15/16	.97	.41	1.72	2.09	15/16	.77	.59	
8BCM8[ ]	1/2	1/2	2.75	7/8	15/16	.97	.42	1.72	2.28	15/16	.77	.59	



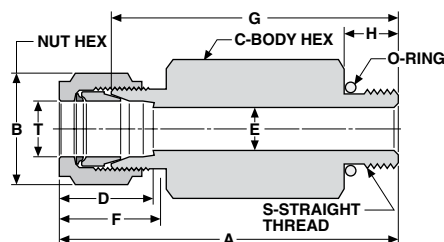
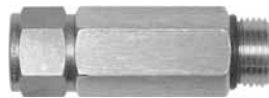
## Bulkhead Connector, Male: BCM/ME

connects metric tube to female NPT threads

Part Number*	T P		Dimensions — mm								J	Panel Hole Size	Max. Panel Thickness
	Tube O.D.	Pipe Thd.	A	B Hex Flat	C Hex Flat	D	E	Fx	G				
3BCM2[ ]ME	3	1/8	48.0	11.1	12.5	14.3	2.2	32.5	40.0	12.7	8.3	12.0	
6BCM2[ ]ME	6	1/8	50.5	14.3	15.9	16.3	3.8	34.6	42.2	15.9	11.5	13.0	
6BCM4[ ]ME	6	1/4	55.2	14.3	15.9	16.3	3.8	34.6	46.8	15.9	11.5	13.0	
6BCM6[ ]ME	6	3/8	55.1	14.3	17.5	16.3	3.8	34.6	46.8	15.9	11.5	13.0	
6BCM8[ ]ME	6	1/2	60.7	14.3	22.2	16.3	3.8	34.6	52.3	15.9	11.5	13.0	
8BCM4[ ]ME	8	1/4	57.0	15.9	15.9	16.7	5.8	36.6	50.0	17.5	13.1	14.0	
10BCM2[ ]ME	10	1/8	54.2	19.1	19.1	17.5	7.8	37.3	46.3	19.1	16.5	14.0	
10BCM4[ ]ME	10	1/4	59.0	19.1	19.1	17.5	6.6	37.3	51.1	19.1	16.5	14.0	
10BCM6[ ]ME	10	3/8	59.0	19.1	19.1	17.5	7.9	37.3	51.1	19.1	16.5	14.0	
12BCM6[ ]ME	12	3/8	66.0	22.2	23.8	24.6	9.9	43.7	54.1	23.8	19.5	16.0	
12BCM8[ ]ME	12	1/2	69.9	22.2	23.8	24.6	9.9	43.7	57.9	23.8	19.5	16.0	
14BCM8[ ]ME	14	1/2	72.0	23.8	23.8	22.2	11.9	41.1	59.0	23.8	19.5	16.0	
16BCM8[ ]ME	16	1/2	70.7	25.4	27.0	25.0	12.7	43.7	59.5	27.0	22.5	14.0	
18BCM8[ ]ME	18	1/2	76.0	28.6	30.0	25.4	12.7	48.0	64.0	30.2	26.0	17.0	
22BCM8[ ]ME	22	1/2	81.0	31.8	33.5	27.0	12.7	53.0	68.0	33.3	29.5	24.0	
25BCM8[ ]ME	25	1/2	88.0	38.1	40.0	33.3	12.7	60.0	73.0	39.7	33.8	24.0	



To specify O-ring material for SAE fittings, see page 6



\* [ ] see page 6 for material specifications.

## Male Connector, SAE: CMS

connects fractional tube to SAE straight thread boss

Part Number*	Dimensions — inches										O-ring Uniform Size #
	T	S	A	B Hex Flat	C Hex Flat	D	E	F	G	H	
2CMS2[ ]	1/8	5/16-24	1.25	7/16	7/16	.56	.09	.67	.94	.30	902
4CMS4[ ]	1/4	7/16-20	1.41	9/16	9/16	.64	.19	.77	1.08	.36	904
4CMS6[ ]	1/4	9/16-18	1.47	9/16	11/16	.64	.19	.77	1.14	.39	906
4CMS8[ ]	1/4	3/4-16	1.55	9/16	7/8	.64	.19	.77	1.22	.44	908
4CMS10[ ]	1/4	7/8-14	1.67	9/16	1	.64	.19	.77	1.34	.50	910
6CMS4[ ]	3/8	7/16-20	1.56	11/16	3/4	.72	.19	.83	1.22	.36	904
6CMS6[ ]	3/8	9/16-18	1.63	11/16	3/4	.72	.30	.83	1.27	.39	906
6CMS8[ ]	3/8	3/4-16	1.61	11/16	7/8	.72	.30	.83	1.27	.44	908
6CMS10[ ]	3/8	7/8-14	1.73	11/16	1	.72	.30	.83	1.38	.50	910
8CMS6[ ]	1/2	9/16-18	1.72	7/8	13/16	.97	.30	.92	1.25	.39	906
8CMS8[ ]	1/2	3/4-16	1.70	7/8	7/8	.97	.42	.92	1.25	.44	908
8CMS12[ ]	1/2	1 1/16-12	1.98	7/8	1 1/4	.97	.42	.92	1.52	.59	912
10CMS10[ ]	5/8	7/8-14	1.83	1	1	1	.50	.92	1.39	.50	910
12CMS8[ ]	3/4	3/4-16	1.91	1 1/8	1 1/16	1	.42	.97	1.45	.44	908
12CMS12[ ]	3/4	1 1/16-12	2.03	1 1/8	1 1/4	1	.66	.97	1.59	.59	912
16CMS12[ ]	1	1 1/16-12	2.19	1 1/2	1 3/8	1.31	.66	1.08	1.63	.59	912
16CMS16[ ]	1	1 5/16-12	2.25	1 1/2	1 1/2	1.31	.88	1.08	1.69	.59	916
20CMS20[ ]	1 1/4	1 5/8-12	2.69	1 7/8	1 7/8	1.62	1.09	1.53	1.82	.59	920
24CMS24[ ]	1 1/2	1 7/8-12	3.06	2 1/4	2 1/8	1.97	1.34	1.78	1.99	.59	924
32CMS32[ ]	2	2 1/2-12	4	3	2 3/4	2.66	1.81	2.47	2.53	.59	932

## Long Male Connector, SAE: LCMS

connects fractional tube to SAE straight thread boss

Part Number*	Dimensions — inches										O-ring Uniform Size #
	T	S	A	B Hex Flat	C Hex Flat	D	E	F	G	H	
4LCMS4[ ]	1/4	7/16-20	2.30	9/16	9/16	.64	.19	.77	1.97	.36	904
6LCMS6[ ]	3/8	9/16-18	2.55	11/16	3/4	.72	.30	.83	2.19	.39	906
8LCMS8[ ]	1/2	3/4-16	3.05	7/8	7/8	.97	.42	.92	2.58	.44	908
12LCMS12[ ]	3/4	1 1/16-12	3.92	1 1/8	1 1/4	1	.66	.97	3.48	.59	912
16LCMS16[ ]	1	1 5/16-12	4.42	1 1/2	1 1/2	1.31	.88	1.08	3.86	.59	916

## O-ring Installation Instructions

HOKE GYROLOK® O-ring seal fittings are used for direct connection to existing pipe thread or straight thread ports—which have a smooth, flat surface perpendicular to the threaded port. O-ring seal fittings provide leak-tight sealing on both vacuum and high pressure systems. In the pipe thread version, a special short thread insures against thread interference.

The standard Buna N O-ring is completely contained in a precision groove, to prevent O-ring extrusion at high pressure. The precision groove also provides a controlled squeeze for a vacuum-tight seal.

The chart lists pertinent dimensions useful with O-ring seal connectors and adapters.

Note:

When installing an O-ring port:

1. Hand-thread until the O-ring compresses on the port end.
2. Snug the fitting to the port with a wrench to completely compress the O-ring.
3. Always use a back-up wrench to hold the O-ring seal fitting body, when connecting or disconnecting a HOKE GYROLOK® end.

To specify O-ring material, see page 6

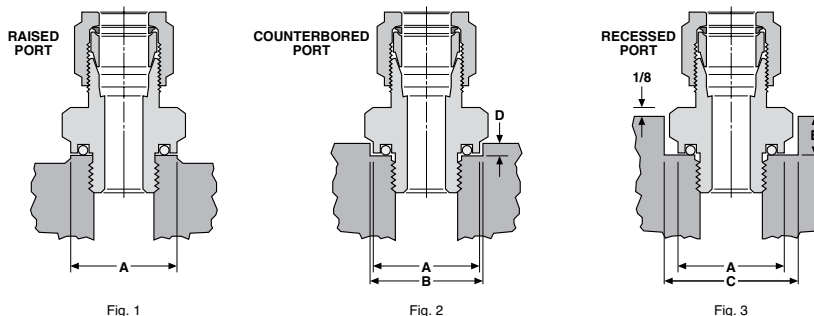


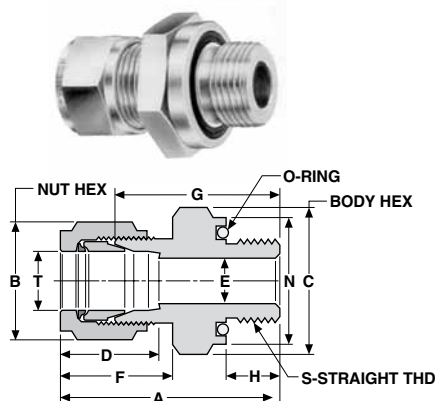
Fig. 1 Fig. 2 Fig. 3  
Mounting Dimensions For O-ring Seal Connectors and Adapters

Straight Thread Size*	Pipe Thread Size**	Diameter			Depth		
		A	B	C	D	E	
5/16-24	—	1/2	9/16	21/32	3/32	3/32	
3/8-24	—	17/32	21/32	3/4	3/32	1/8	
7/16-20	—	11/16	25/32	7/8	3/32	5/32	
1/2-20	—	3/4	29/32	1 1/32	3/32	11/64	
9/16-18	—	13/16	31/32	1 3/32	3/32	11/64	
3/4-16	—	1	1 5/32	1 5/16	3/32	7/32	
7/8-14	—	1 7/32	1 11/32	1 17/32	3/32	5/16	
1 1/16-12	—	1 13/32	1 17/32	1 3/4	3/32	11/32	
1 5/16-12	—	1 11/16	1 25/32	2 1/32	3/32	7/16	
—	1/8 NPT	11/16	25/32	7/8	3/32	9/64	
—	1/4 NPT	13/16	31/32	1 3/32	3/32	11/64	
—	3/8 NPT	1	1 5/32	1 5/16	3/32	3/16	
—	1/2 NPT	1 7/32	1 11/32	1 17/32	3/32	5/16	
—	3/4 NPT	1 13/32	1 17/32	1 3/4	3/32	3/8	
—	1 NPT	1 11/16	1 25/32	2 1/32	3/32	27/64	

Dimensions for reference only, subject to change.

## O-ring Straight Connector: COS

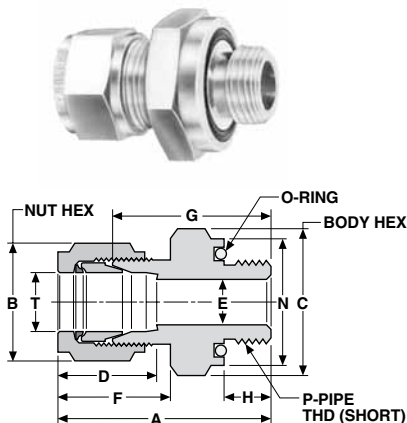
connects fractional tube to female straight thread



Part Number*	T S		Dimensions — inches										O-ring	
	Tube O.D.	Thread Size	A	B Hex Flat	C Hex Flat	D	E	F	G	H	N	I.D.	O.D.	
1COS[ ]	1/16	5/16-24	1.13	5/16	9/16	.41	.05	.48	.91	.34	.56	.31	.44	
2COS[ ]	1/8	5/16-24	1.25	7/16	9/16	.56	.09	.67	1.03	.34	.56	.31	.44	
3COS[ ]	3/16	3/8-24	1.41	1/2	5/8	.59	.13	.70	1.09	.38	.63	.38	.50	
4COS[ ]	1/4	7/16-20	1.55	9/16	3/4	.64	.19	.77	1.22	.41	.75	.44	.63	
6COS[ ]	3/8	9/16-18	1.72	11/16	15/16	.72	.30	.83	1.38	.47	.94	.56	.75	
8COS6[ ]	1/2	9/16-18	1.88	7/8	15/16	.97	.30	.92	1.41	.47	.94	.58	.78	
8COS[ ]	1/2	3/4-16	1.88	7/8	1 1/8	.97	.42	.92	1.41	.47	1.13	.75	.94	
10COS[ ]	5/8	7/8-14	1.94	1	1 5/16	1	.50	.92	1.50	.47	1.31	.88	1.13	
12COS[ ]	3/4	1 1/16-12	2.09	1 1/8	1 1/2	1	.66	.97	1.66	.56	1.50	1.06	1.31	
14COS[ ]	7/8	1 1/16-12	2.09	1 1/4	1 1/2	1.06	.72	.97	1.66	.56	1.50	1.06	1.31	
16COS[ ]	1	1 5/16-12	2.38	1 1/2	1 3/4	1.31	.88	1.08	1.81	.56	1.75	1.31	1.56	

## O-ring Male Connector: COM

connects fractional tube to female NPT threads

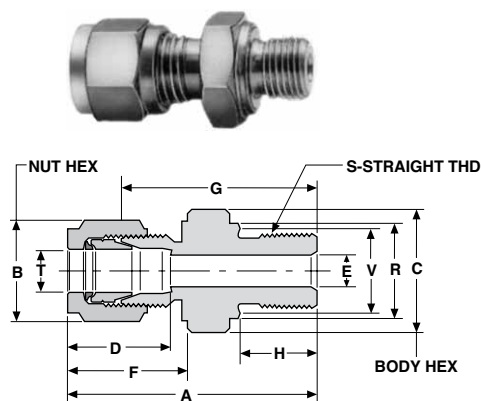


Part Number*	T P		Dimensions — inches										O-ring	
	Tube O.D.	Pipe Thd.	A	B Hex Flat	C Hex Flat	D	E	F	G	H	N	I.D.	O.D.	
1COM2[ ]	1/16	1/8	1.06	5/16	3/4	.41	.05	.48	.84	.28	.75	.44	.63	
2COM2[ ]	1/8	1/8	1.34	7/16	3/4	.56	.09	.67	1.03	.28	.75	.44	.63	
2COM4[ ]	1/8	1/4	1.47	7/16	15/16	.56	.09	.67	1.16	.38	.94	.56	.75	
3COM2[ ]	3/16	1/8	1.38	1/2	3/4	.59	.13	.70	1.06	.28	.75	.44	.63	
3COM4[ ]	3/16	1/4	1.50	1/2	15/16	.59	.13	.70	1.19	.38	.94	.56	.75	
4COM2[ ]	1/4	1/8	1.42	9/16	3/4	.64	.19	.77	1.09	.28	.75	.44	.63	
4COM4[ ]	1/4	1/4	1.55	9/16	15/16	.64	.19	.77	1.22	.38	.94	.56	.75	
4COM6[ ]	1/4	3/8	1.61	9/16	1 1/8	.64	.19	.77	1.28	.41	1.13	.75	.94	
6COM2[ ]	3/8	1/8	1.50	11/16	3/4	.72	.19	.83	1.16	.28	.75	.44	.63	
6COM4[ ]	3/8	1/4	1.63	11/16	15/16	.72	.28	.83	1.28	.38	.94	.56	.75	
6COM6[ ]	3/8	3/8	1.69	11/16	1 1/8	.72	.28	.83	1.34	.41	1.13	.75	.94	
6COM8[ ]	3/8	1/2	1.91	11/16	1 5/16	.72	.28	.83	1.56	.53	1.31	.88	1.13	
8COM4[ ]	1/2	1/4	1.75	7/8	15/16	.97	.28	.92	1.28	.38	.94	.56	.75	
8COM6[ ]	1/2	3/8	1.81	7/8	1 1/8	.97	.41	.92	1.34	.41	1.13	.75	.94	
8COM8[ ]	1/2	1/2	2.03	7/8	1 5/16	.97	.41	.92	1.56	.53	1.31	.88	1.13	
10COM8[ ]	5/8	1/2	2	1	1 5/16	1	.50	.92	1.56	.53	1.31	.88	1.13	
10COM12[ ]	5/8	3/4	2.09	1	1 1/2	1	.50	.92	1.66	.56	1.50	1.06	1.31	
12COM8[ ]	3/4	1/2	2	1 1/8	1 5/16	1	.55	.97	1.56	.53	1.31	.88	1.13	
12COM12[ ]	3/4	3/4	2.09	1 1/8	1 1/2	1	.63	.97	1.66	.56	1.50	1.06	1.31	
16COM12[ ]	1	3/4	2.31	1 1/2	1 1/2	1.31	.63	1.08	1.75	.56	1.50	1.06	1.31	
16COM16[ ]	1	1	2.38	1 1/2	1 3/4	1.31	.88	1.08	1.91	.66	1.75	1.31	1.56	

\* [ ] see page 6 for material specifications.

## Male Connector: CM/EB

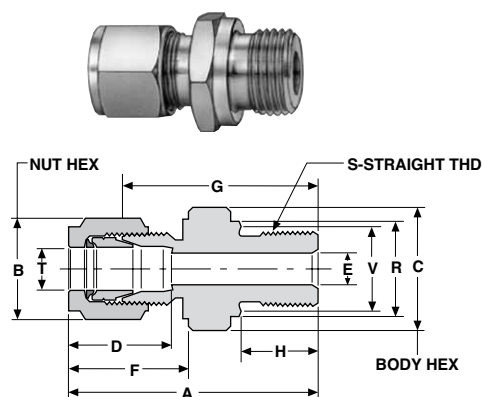
connects **fractional** tube with RP parallel threads



Part Number*	T		S									
	Tube O.D.	Thd. Size	A	B	C	D	E	F	G	H	R	V
2CM2[ ]EB	1/8	1/8	1.25	7/16	5/8	.56	.09	.67	.94	.31	.55	.52
2CM4[ ]EB	1/8	1/4	1.42	7/16	3/4	.56	.09	.67	1.11	.47	.70	.67
4CM2[ ]EB	1/4	1/8	1.34	9/16	5/8	.64	.19	.77	1.02	.31	.55	.52
4CM4[ ]EB	1/4	1/4	1.52	9/16	3/4	.64	.19	.77	1.19	.47	.70	.67
4CM6[ ]EB	1/4	3/8	1.55	9/16	15/16	.64	.19	.77	1.22	.47	.86	.83
4CM8[ ]EB	1/4	1/2	1.67	9/16	1 1/16	.64	.19	.77	1.34	.55	1.03	.98
6CM4[ ]EB	3/8	1/4	1.61	11/16	3/4	.72	.27	.83	1.23	.47	.70	.67
6CM6[ ]EB	3/8	3/8	1.64	11/16	15/16	.72	.27	.83	1.27	.47	.86	.83

## Male Connector: CM/MB

connects **metric** tube with RP parallel threads



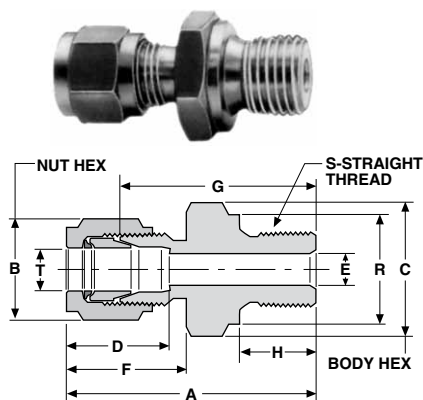
Part Number*	T		S									
	Tube O.D.	Straight Thd.	A	B Hex Flat	C Hex Flat	D	E	F	G	H	R	V
3CM2[ ]MB	3	1/8	32.8	11.1	14.3	14.3	2.2	17.1	24.9	8.0	14.0	13.0
3CM4[ ]MB	3	1/4	37.2	11.1	19.1	14.3	2.2	17.1	29.2	12.0	18.0	17.0
6CM2[ ]MB	6	1/8	35.8	14.3	14.3	16.3	3.8	19.5	27.4	8.0	14.0	13.0
6CM4[ ]MB	6	1/4	40.1	14.3	19.1	16.3	3.8	19.5	31.8	12.0	18.0	17.0
6CM6[ ]MB	6	3/8	40.1	14.3	22.2	16.3	3.8	19.5	31.8	12.0	22.0	21.0
6CM8[ ]MB	6	1/2	43.4	14.3	27.0	16.3	3.8	19.5	35.1	14.0	26.0	25.0
8CM2[ ]MB	8	1/8	34.7	15.9	14.3	16.7	4.6	19.1	26.7	8.0	14.0	13.0
8CM4[ ]MB	8	1/4	39.5	15.9	19.1	16.7	5.8	19.1	31.5	12.0	18.0	17.0
8CM6[ ]MB	8	3/8	40.5	15.9	22.0	16.7	5.8	19.1	32.5	12.0	22.0	21.0
8CM8[ ]MB	8	1/2	43.1	15.9	27.0	16.7	5.8	19.1	35.1	14.0	26.0	25.0
8CM12[ ]MB	8	3/4	45.0	15.9	33.5	16.7	6.0	19.1	37.0	12.0	32.0	30.0
10CM2[ ]MB	10	1/8	36.9	19.1	17.5	17.5	4.6	19.8	29.0	8.0	14.0	13.0
10CM4[ ]MB	10	1/4	41.0	19.1	19.1	17.5	5.8	19.8	33.0	12.0	18.0	17.0
10CM6[ ]MB	10	3/8	41.5	19.1	24.0	17.5	7.4	19.8	33.5	12.0	22.0	21.0
10CM8[ ]MB	10	1/2	44.1	19.1	27.0	17.5	7.9	19.8	36.1	14.0	26.0	25.0
12CM4[ ]MB	12	1/4	44.5	22.2	22.2	24.6	7.0	23.4	32.5	12.0	18.0	17.0
12CM6[ ]MB	12	3/8	45.0	22.2	24.0	24.6	10.0	23.4	33.0	12.0	22.0	21.0
12CM8[ ]MB	12	1/2	47.5	22.2	27.0	24.6	9.9	23.4	35.6	14.0	26.0	25.0
12CM12[ ]MB	12	3/4	49.5	22.2	33.3	24.6	9.9	23.4	37.6	16.0	32.0	30.0
14CM4[ ]MB	14	1/4	41.9	23.8	22.2	22.2	7.0	21.0	32.5	12.0	18.0	17.0
14CM6[ ]MB	14	3/8	42.4	23.8	22.2	22.2	9.9	21.0	33.0	12.0	22.0	21.0
14CM8[ ]MB	14	1/2	45.2	23.8	27.0	22.2	11.9	21.0	35.8	14.0	26.0	25.0
15CM8[ ]MB	15	1/2	46.6	23.8	27.0	22.2	12.7	21.8	36.3	14.0	26.0	25.0
16CM6[ ]MB	16	3/8	44.9	25.4	23.8	25.0	9.9	23.4	33.8	12.0	22.0	21.0
16CM8[ ]MB	16	1/2	47.5	25.4	27.0	25.0	12.7	23.4	36.3	14.0	26.0	25.0
16CM12[ ]MB	16	3/4	49.5	25.4	33.3	25.0	12.7	23.4	38.4	16.0	32.0	30.0
18CM8[ ]MB	18	1/2	47.3	28.6	27.0	25.4	12.7	24.6	37.3	14.0	26.0	25.0
18CM12[ ]MB	18	3/4	49.1	28.6	33.3	25.4	15.8	24.6	37.1	16.0	32.0	30.0
20CM8[ ]MB	20	1/2	52.5	31.8	30.2	31.0	11.9	27.0	38.6	14.0	26.0	25.0
22CM8[ ]MB	22	1/2	50.6	31.8	30.2	27.0	12.6	24.6	39.4	14.0	26.0	25.0
22CM12[ ]MB	22	3/4	52.6	31.8	33.3	27.0	17.9	24.6	41.4	16.0	32.0	30.0
22CM16[ ]MB	22	1	54.6	31.8	41.3	27.0	17.9	24.6	43.4	18.0	39.0	37.0
25CM12[ ]MB	25	3/4	59.9	38.1	34.9	33.3	18.1	27.4	45.5	16.0	32.0	30.0
25CM16[ ]MB	25	1	57.6	38.1	41.3	33.3	21.7	27.4	43.2	18.0	39.0	37.0

RP parallel thread ends are typically used with a flat gasket to seal.

\* [ ] see page 6 for material specifications.

### Male Connector: CM/EA

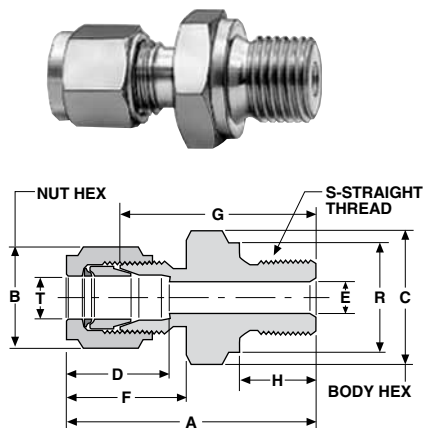
connects fractional tube with RS parallel threads



Part Number*	T		S		Dimensions — inches						
	Tube O.D.	Thd. Size	A	B	C	D	E	F	G	H	R
2CM2[ ]EA	1/8	1/8	1.19	7/16	9/16	.56	.09	.67	.72	.31	.55
2CM4[ ]EA	1/8	1/4	1.41	7/16	3/4	.56	.09	.67	1.09	.47	.70
2CM6[ ]EA	1/8	3/8	1.47	7/16	7/8	.56	.09	.67	1.16	.47	.86
4CM2[ ]EA	1/4	1/8	1.30	9/16	9/16	.64	.19	.77	.97	.31	.55
4CM4[ ]EA	1/4	1/4	1.48	9/16	3/4	.64	.19	.77	1.16	.47	.70
4CM6[ ]EA	1/4	3/8	1.55	9/16	7/8	.64	.19	.77	1.22	.47	.86
4MC8[ ]EA	1/4	1/2	1.67	9/16	1 1/16	.64	.19	.77	1.34	.55	1.03
6CM4[ ]EA	3/8	1/4	1.61	11/16	3/4	.72	.30	.83	1.25	.47	.70
6CM6[ ]EA	3/8	3/8	1.61	11/16	7/8	.72	.30	.83	1.25	.47	.86
6CM8[ ]EA	3/8	1/2	1.73	11/16	1 1/16	.72	.30	.83	1.38	.55	1.03
8CM4[ ]EA	1/2	1/4	1.75	7/8	13/16	.97	.23	.92	1.25	.47	.70
8CM6[ ]EA	1/2	3/8	1.75	7/8	7/8	.97	.23	.92	1.25	.47	.86
8CM8[ ]EA	1/2	1/2	1.72	7/8	1 1/16	.97	.23	.92	1.38	.55	1.03
12CM8[ ]EA	3/4	1/2	1.88	1 1/8	1 1/16	1	.39	.97	1.50	.55	1.03
12CM12[ ]EA	3/4	3/4	1.92	1 1/8	1 5/16	1	.39	.97	1.48	.63	1.27
16CM8[ ]EA	1	1/2	2	1 1/2	1 3/8	1.31	.47	1.08	1.44	.55	1.03
16CM16[ ]EA	1	1	2.23	1 1/2	1 5/8	1.31	.70	1.08	1.67	.70	1.53

### Male Connector: CM/MA

connects metric tube with RS parallel threads




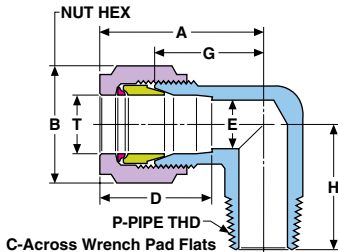
Part Number*	T		S		Dimensions — mm						
	Tube Size	Thd. Size	A	B Hex Flat	C Hex Flat	D	E	F	G	H	R
3CM2[ ]MA	3	1/8	32.8	11.1	14.3	14.3	2.2	17.1	24.9	8.0	14.0
3CM4[ ]MA	3	1/4	37.2	11.1	19.1	14.3	2.2	17.1	29.2	12.0	18.0
6CM2[ ]MA	6	1/8	35.8	14.3	14.3	16.3	3.8	19.5	27.4	8.0	14.0
6CM4[ ]MA	6	1/4	40.1	14.3	19.1	16.3	3.8	19.5	31.8	12.0	18.0
6CM6[ ]MA	6	3/8	40.1	14.3	22.2	16.3	3.8	19.5	31.8	12.0	22.0
6CM8[ ]MA	6	1/2	43.4	14.3	27.0	16.3	3.8	19.5	35.1	14.0	26.0
8CM2[ ]MA	8	1/8	34.7	15.9	14.3	16.7	5.8	19.1	26.7	8.0	14.0
8CM4[ ]MA	8	1/4	39.5	15.9	19.1	16.7	5.8	19.1	31.5	12.0	18.0
8CM6[ ]MA	8	3/8	43.0	15.9	22.0	16.7	5.8	19.1	35.0	12.0	22.0
8CM8[ ]MA	8	1/2	43.1	15.9	27.0	16.7	5.8	19.1	35.0	14.0	26.0
8CM12[ ]MA	8	3/4	48.0	15.9	33.0	16.7	6.5	19.1	38.0	12.0	32.0
10CM2[ ]MA	10	1/8	37.0	19.1	17.5	17.5	4.6	19.8	29.0	8.0	14.0
10CM4[ ]MA	10	1/4	41.0	19.1	19.0	17.5	5.8	19.8	33.0	12.0	18.0
10CM6[ ]MA	10	3/8	44.0	19.1	22.0	17.5	6.0	19.8	36.0	12.0	22.0
10CM8[ ]MA	10	1/2	44.1	19.1	27.0	17.5	7.9	19.8	36.1	14.0	26.0
12CM4[ ]MA	12	1/4	44.5	22.2	22.2	24.6	5.8	23.4	32.5	12.0	18.0
12CM6[ ]MA	12	3/8	47.5	22.2	22.0	24.6	6.0	23.4	35.5	12.0	22.0
12CM8[ ]MA	12	1/2	47.5	22.2	27.0	24.6	9.9	23.4	35.6	14.0	26.0
12CM12[ ]MA	12	3/4	49.5	22.2	33.3	24.6	9.9	23.4	37.6	16.0	33.0
14CM4[ ]MA	14	1/4	41.9	23.8	22.2	22.2	5.8	21.0	32.5	12.0	18.0
14CM6[ ]MA	14	3/8	42.4	23.8	22.2	22.2	7.8	21.0	33.0	12.0	22.0
14CM8[ ]MA	14	1/2	45.2	23.8	27.0	22.2	11.9	21.0	35.8	14.0	26.0
15CM8[ ]MA	15	1/2	46.6	23.8	27.0	22.2	12.7	21.8	36.3	14.0	26.0
16CM6[ ]MA	16	3/8	45.0	25.4	23.8	25.0	7.8	23.4	33.8	12.0	22.0
16CM8[ ]MA	16	1/2	47.5	25.4	27.0	25.0	12.7	23.4	36.3	14.0	26.0
16CM12[ ]MA	16	3/4	49.5	25.4	33.3	25.0	12.7	23.4	38.4	16.0	32.0
18CM8[ ]MA	18	1/2	47.3	28.6	27.0	25.4	11.4	24.6	37.3	14.0	26.0
18CM12[ ]MA	18	3/4	49.1	28.6	33.3	25.4	15.3	24.6	39.1	16.0	32.0
20CM8[ ]MA	20	1/2	52.5	31.8	30.2	31.0	11.9	27.0	38.6	14.0	26.0
22CM8[ ]MA	22	1/2	50.6	31.8	30.2	27.0	11.4	24.6	39.4	14.0	26.0
22CM12[ ]MA	22	3/4	52.6	31.8	33.3	27.0	15.8	24.6	41.4	16.0	32.0
22CM16[ ]MA	22	1	54.6	31.8	41.3	27.0	17.9	24.6	43.4	18.0	39.0
25CM12[ ]MA	25	3/4	59.9	38.1	34.9	33.3	17.9	27.4	45.5	16.0	32.0
25CM16[ ]MA	25	1	57.6	38.1	41.3	33.3	17.9	27.4	43.2	18.0	39.0

RS parallel thread ends are typically used with a gasket having a bonded elastomer seal. RP-type gaskets may also be used.

\* [ ] see page 6 for material specifications.

## Male Elbow: LM


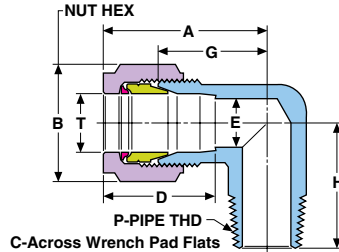
connects **fractional** tube to female NPT thread

Part Number*	T		P							
	Tube O.D.	Male NPT Size	Dimensions — inches							
			A	B Hex Flat	C	D	E	G	H	
1LM1[ ]	1/16	1/16	.78	5/16	7/16	.41	.05	.56	.72	
1LM2[ ]	1/16	1/8	.78	5/16	7/16	.41	.05	.56	.88	
2LM1[ ]	1/8	1/16	.97	7/16	7/16	.56	.09	.66	.72	
2LM2[ ]	1/8	1/8	.97	7/16	7/16	.56	.09	.66	.72	
2LM4[ ]	1/8	1/4	1.09	7/16	1/2	.56	.09	.78	.94	
3LM2[ ]	3/16	1/8	1	1/2	7/16	.59	.13	.69	.75	
3LM4[ ]	3/16	1/4	1	1/2	1/2	.59	.13	.72	.94	
4LM2[ ]	1/4	1/8	1.05	9/16	7/16	.64	.19	.72	.78	
4LM4[ ]	1/4	1/4	1.11	9/16	1/2	.64	.19	.78	1	
4LM6[ ]	1/4	3/8	1.20	9/16	11/16	.64	.19	.88	1.13	
4LM8[ ]	1/4	1/2	1.33	9/16	13/16	.64	.42	1	1.25	
6LM2[ ]	3/8	1/8	1.19	11/16	1/2	.72	.19	.84	.88	
6LM4[ ]	3/8	1/4	1.19	11/16	1/2	.72	.30	.84	1	
6LM6[ ]	3/8	3/8	1.28	11/16	11/16	.72	.30	.94	1.13	
6LM8[ ]	3/8	1/2	1.38	11/16	13/16	.72	.30	1.03	1.25	
8LM4[ ]	1/2	1/4	1.44	7/8	11/16	.97	.30	.97	1.13	
8LM6[ ]	1/2	3/8	1.44	7/8	11/16	.97	.41	.97	1.13	
8LM8[ ]	1/2	1/2	1.50	7/8	11/16	.97	.42	1.03	1.31	
8LM12[ ]	1/2	3/4	1.56	7/8	1	.97	.72	1.06	1.50	
10LM6[ ]	5/8	3/8	1.47	1	13/16	1	.41	1.03	1.25	
10LM8[ ]	5/8	1/2	1.47	1	13/16	1	.50	1.03	1.38	
12LM8[ ]	3/4	1/2	1.59	1 1/8	1	1	.50	1.16	1.50	
12LM12[ ]	3/4	3/4	1.59	1 1/8	1	1	.66	1.16	1.50	
14LM12[ ]	7/8	3/4	1.72	1 1/4	1 1/4	1.06	.72	1.28	1.50	
16LM12[ ]	1	3/4	1.88	1 1/2	1 1/4	1.31	.72	1.31	1.66	
16LM16[ ]	1	1	1.88	1 1/2	1 1/4	1.31	.88	1.31	1.84	
20LM20[ ]	1 1/4	1 1/4	2.62	1 7/8	1 11/16	1.53	1.09	1.75	1.88	
24LM24[ ]	1 1/2	1 1/2	3.07	2 1/4	2	1.78	1.34	2	2.38	
32LM32[ ]	2	2	4.22	3	2 3/4	2.47	1.81	2.75	2.78	

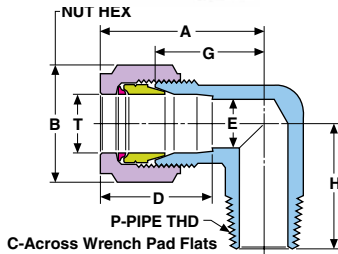
## Male Elbow: LM/ME, LM/MC

connects **metric** tube with NPT or RT tapered threads

Part Number*	T		P							
	Tube O.D.	Male NPT Size	Dimensions — mm							
NPT Threads	RT Threads		A	B Hex Flat	C	D	E	G	H	
3LM2[ ]ME	3LM2[ ]MC	3	1/8	24.7	11.1	11.0	14.3	2.2	16.8	19.8
3LM4[ ]ME	3LM4[ ]MC	3	1/4	27.8	11.1	13.7	14.3	2.2	19.8	23.8
4LM2[ ]ME	4LM2[ ]MC	4	1/8	25.3	12.7	11.7	15.1	2.3	17.5	19.1
4LM4[ ]ME	4LM4[ ]MC	4	1/4	25.3	12.7	13.7	15.1	2.3	17.5	23.8
6LM2[ ]ME	6LM2[ ]MC	6	1/8	26.3	14.3	11.7	16.3	3.8	18.3	19.8
6LM4[ ]ME	6LM4[ ]MC	6	1/4	28.2	14.3	13.7	16.3	3.8	19.8	25.4
6LM6[ ]ME	6LM6[ ]MC	6	3/8	30.6	14.3	17.2	16.3	3.8	22.2	28.6
6LM8[ ]ME	6LM8[ ]MC	6	1/2	33.8	14.3	21.3	16.3	3.8	25.4	31.8
8LM2[ ]ME	8LM2[ ]MC	8	1/8	28.6	15.9	12.7	16.7	5.8	20.6	22.2
8LM4[ ]ME	8LM4[ ]MC	8	1/4	28.6	15.9	13.7	16.7	5.8	20.6	25.4
8LM6[ ]ME	8LM6[ ]MC	8	3/8	31.0	15.9	17.2	16.7	5.8	23.0	28.6
8LM8[ ]ME	8LM8[ ]MC	8	1/2	34.2	15.9	21.4	16.7	5.8	26.2	31.8
10LM2[ ]ME	10LM2[ ]MC	10	1/8	31.9	19.1	17.5	17.5	4.6	23.9	23.9
10LM4[ ]ME	10LM4[ ]MC	10	1/4	32.6	19.1	17.8	17.5	7.1	24.6	28.7
10LM6[ ]ME	10LM6[ ]MC	10	3/8	31.8	19.1	17.2	17.5	7.9	28.8	28.6
10LM8[ ]ME	10LM8[ ]MC	10	1/2	34.1	19.1	21.3	17.5	7.9	26.2	31.8
12LM4[ ]ME	12LM4[ ]MC	12	1/4	36.6	22.2	17.8	24.6	7.1	24.6	28.6
12LM6[ ]ME	12LM6[ ]MC	12	3/8	36.6	22.2	17.8	24.6	9.9	24.6	28.7
12LM8[ ]ME	12LM8[ ]MC	12	1/2	38.1	22.2	21.3	24.6	9.9	26.2	33.3
12LM12[ ]ME	12LM12[ ]MC	12	3/4	41.3	22.2	26.7	24.6	9.9	29.4	38.1
14LM6[ ]ME	14LM6[ ]MC	14	3/8	35.6	23.8	20.6	22.2	10.2	26.2	30.6
14LM8[ ]ME	14LM8[ ]MC	14	1/2	35.6	23.8	22.6	22.2	11.9	26.2	33.3
15LM8[ ]ME	15LM8[ ]MC	15	1/2	36.5	23.8	20.7	22.2	12.7	26.2	31.8
16LM6[ ]ME	16LM6[ ]MC	16	3/8	37.3	25.4	20.6	25.0	10.2	26.2	32.2
16LM8[ ]ME	16LM8[ ]MC	16	1/2	37.3	25.4	21.5	25.0	12.7	26.2	33.3
16LM12[ ]ME	16LM12[ ]MC	16	3/4	40.6	25.4	26.7	25.0	12.7	29.5	38.1
18LM8[ ]ME	18LM8[ ]MC	18	1/2	39.5	28.6	24.9	25.4	12.7	29.5	38.1
18LM12[ ]ME	18LM12[ ]MC	18	3/4	39.3	28.6	25.4	25.4	15.8	29.4	38.1
20LM8[ ]ME	20LM8[ ]MC	20	1/2	46.4	31.8	31.8	31.0	12.7	32.5	38.1
20LM12[ ]ME	20LM12[ ]MC	20	3/4	46.4	31.8	31.8	31.0	16.7	32.5	39.4
22LM8[ ]ME	22LM8[ ]MC	22	1/2	43.7	31.8	31.8	27.0	12.6	32.5	38.1
22LM12[ ]ME	22LM12[ ]MC	22	3/4	44.5	31.8	31.8	27.0	17.9	33.3	41.7
22LM16[ ]ME	22LM16[ ]MC	22	1	43.7	31.8	33.3	27.0	17.9	32.5	46.7
25LM12[ ]ME	25LM12[ ]MC	25	3/4	47.7	38.1	31.8	33.3	18.1	33.3	42.2
25LM16[ ]ME	25LM16[ ]MC	25	1	47.7	38.1	33.3	33.3	21.7	33.3	46.7

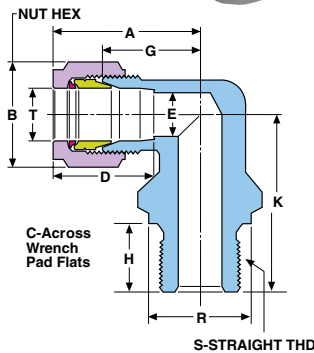
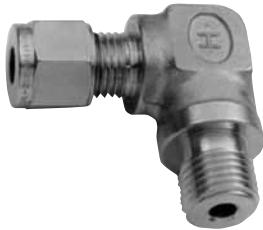
\* [ ] see page 6 for material specifications.



### Male Elbow: LM/EC

connects **fractional** tube with RT tapered threads

Part Number*	T		P							
	Tube O.D.	Pipe Thd.	A	B		C	D	E	G	H
4LM2[ ]EC	1/4	1/8	1.05	9/16	7/16	.64	.19	.72	.78	
4LM4[ ]EC	1/4	1/4	1.11	9/16	1/2	.64	.19	.78	1	
8LM4[ ]EC	1/2	1/4	1.44	7/8	11/16	.97	.30	.97	1.13	
8LM6[ ]EC	1/2	3/8	1.44	7/8	11/16	.97	.41	.97	1.13	
8LM8[ ]EC	1/2	1/2	1.50	7/8	13/16	.97	.42	1.03	1.31	

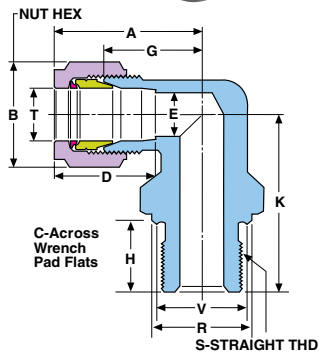


### Male Elbow: LM/MA

connects **metric** with RS parallel threads

Part Number*	T		S									
	Tube O.D.	Straight Thd.	A	B		C	D	E	G	H	K	R
6LM4[ ]MA	6	1/4	33.0	14.3	17.3	16.3	3.8	24.6	12.0	27.9	18.0	
8LM4[ ]MA	8	1/4	34.2	15.9	20.5	16.7	7.6	26.2	12.0	34.3	18.0	
10LM4[ ]MA	10	1/4	32.6	19.1	16.7	17.5	5.8	24.6	12.0	28.7	18.0	
10LM8[ ]MA	10	1/2	37.2	19.1	20.5	17.5	7.9	29.2	14.0	38.1	26.0	
12LM4[ ]MA	12	1/4	38.1	22.2	22.3	24.6	5.8	26.2	12.0	34.3	18.0	
12LM8[ ]MA	12	1/2	40.6	22.2	20.5	24.6	9.9	28.7	14.0	38.1	26.0	
16LM6[ ]MA	16	3/8	40.6	25.4	26.1	25.0	7.8	29.5	12.0	38.1	22.0	
16LM8[ ]MA	16	1/2	40.6	25.4	20.5	25.0	11.8	29.5	14.0	38.1	26.0	
22LM12[ ]MA	22	3/4	43.7	31.8	28.5	27.0	15.8	32.5	16.0	44.5	32.0	

RS parallel thread ends are typically used with a gasket having a bonded elastomer seal. RP-type gaskets may also be used.



### Male Elbow: LM/MB

connects **metric** with RP parallel threads

Part Number*	T		S										
	Tube O.D.	Straight Thd.	A	B		C	D	E	G	H	K	R	V
6LM2[ ]MB	6	1/8	29.0	14.3	12.6	16.3	3.8	20.6	8.0	21.8	14.0	13.0	
6LM4[ ]MB	6	1/4	29.0	14.3	12.6	16.3	3.8	20.6	12.0	29.0	18.0	17.0	

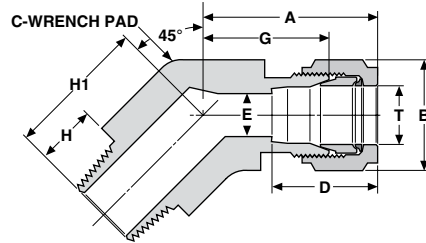
RP parallel thread ends are typically used with a flat gasket to seal.

\* [ ] see page 6 for material specifications.



### 45° Male Elbow: LMF

connects fractional tube to female NPT thread

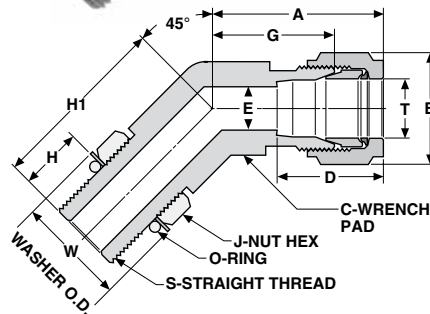


Part Number*	T Pipe		Dimensions — inches							
	O.D.	Thd.	A	B	C	D	E	G	H	H1
4LMF2[ ]	1/4	1/8	1.05	.56	.50	.64	.19	.72	.38	.78
4LMF4[ ]	1/4	1/4	1.11	.56	.63	.64	.19	.78	.56	1
6LMF2[ ]	3/8	1/8	1.19	.69	.63	.72	.19	.84	.38	.88
6LMF4[ ]	3/8	1/4	1.19	.69	.63	.72	.30	.84	.56	1
6LMF6[ ]	3/8	3/8	1.28	.69	.81	.72	.30	.94	.56	1.13
8LMF6[ ]	1/2	3/8	1.44	.88	.81	.97	.41	.97	.56	1.13
8LMF8[ ]	1/2	1/2	1.53	.88	.94	.97	.42	1.06	.75	1.38

To specify O-ring material for SAE fittings, see page 6

### 45° Male Elbow, SAE, Positionable: LMFS

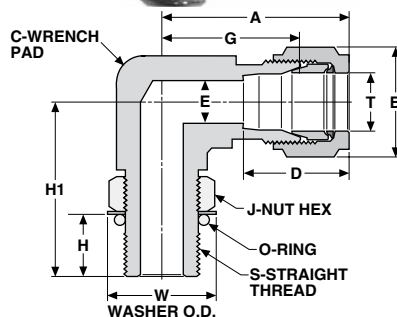
connects fractional tube to SAE straight thread boss



Part Number*	Dimensions — inches											O-ring Uniform Size #	
	T	S	A	B	C	D	E	G	H	H1	J Hex Flat		W
4LMFS4[ ]	1/4	7/16-20	1.05	9/16	1/2	.64	.19	.78	.39	1.05	9/16	.66	904
6LMFS6[ ]	3/8	9/16-18	1.19	11/16	5/8	.72	.30	.84	.44	1.14	11/16	.80	906
8LMFS8[ ]	1/2	3/4-16	1.44	7/8	13/16	.97	.42	.97	.50	1.30	7/8	1.02	908
12LMFS12[ ]	3/4	1 1/16-12	1.59	1 1/8	1 1/8	1	.66	1.16	.66	1.73	1 1/4	1.44	912
16LMFS16[ ]	1	1 5/16-12	1.88	1 7/8	1 3/8	1.31	.88	1.31	.66	1.86	1 1/2	1.73	916

### Male Elbow, SAE, Positionable: LMS

connects fractional tube to SAE straight thread boss



Part Number*	Dimensions — inches											O-ring Uniform Size #	
	T	S	A	B	C	D	E	G	H	H1	J Hex Flat		W
4LMS4[ ]	1/4	7/16-20	1.17	9/16	1/2	.64	.19	.84	.39	1.03	9/16	.66	904
4LMS6[ ]	1/4	9/16-18	1.31	9/16	13/16	.64	.19	.98	.44	1.25	11/16	.80	906
6LMS6[ ]	3/8	9/16-18	1.38	11/16	13/16	.72	.30	1.03	.44	1.25	11/16	.80	906
6LMS8[ ]	3/8	3/4-16	1.41	11/16	1	.72	.30	1.06	.50	1.48	7/8	1.02	908
8LMS8[ ]	1/2	3/4-16	1.59	7/8	1	.97	.42	1.13	.50	1.45	7/8	1.02	908
12LMS12[ ]	3/4	1 1/16-12	1.69	1 1/8	1 1/4	1	.66	1.25	.66	1.94	1 1/4	1.44	912
16LMS16[ ]	1	1 5/16-12	1.88	1 1/2	1 1/4	1.31	.88	1.31	.66	2.05	1 1/2	1.73	916
20LMS20[ ]	1 1/4	1 5/8-12	2.67	1 7/8	1 11/16	1.62	1.09	1.80	.66	2.29	1 7/8	2.16	920
24LMS24[ ]	1 1/2	1 7/8-12	3.07	2 1/4	2	1.97	1.34	2	.66	2.38	2 1/8	2.45	924

\* [ ] see page 6 for material specifications.

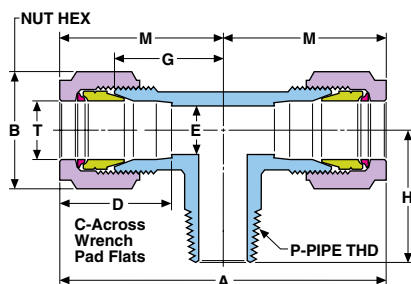


## Male Branch: TTM

connects **fractional** tube to female NPT threads



Metric fitting shown



Part Number*	T P		Dimensions — inches							
	Tube O.D.	Male Pipe Size	A	B Hex Flat	C	D	E	G	H	M
1TTM1[ ]	1/16	1/16	1.56	5/16	7/16	.41	.05	.56	.72	.78
2TTM2[ ]	1/8	1/8	1.94	7/16	7/16	.56	.09	.66	.72	.97
2TTM4[ ]	1/8	1/4	2	7/16	1/2	.56	.09	.69	.84	1
3TTM2[ ]	3/16	1/8	2	1/2	7/16	.59	.13	.69	.75	1
4TTM2[ ]	1/4	1/8	2.09	9/16	7/16	.64	.19	.72	.78	1.05
4TTM4[ ]	1/4	1/4	2.22	9/16	1/2	.64	.19	.78	1.03	1.11
6TTM4[ ]	3/8	1/4	2.38	11/16	1/2	.72	.30	.84	1	1.19
6TTM6[ ]	3/8	3/8	2.59	11/16	11/16	.72	.41	.94	1.13	1.30
6TTM8[ ]	3/8	1/2	2.75	11/16	13/16	.72	.30	1.03	1.31	1.38
8TTM4[ ]	1/2	1/4	2.88	7/8	11/16	.97	.28	.97	1	1.44
8TTM6[ ]	1/2	3/8	2.88	7/8	11/16	.97	.41	.97	1.13	1.44
8TTM8[ ]	1/2	1/2	3	7/8	13/16	.97	.42	1.03	1.31	1.50
10TTM6[ ]	5/8	3/8	2.94	1	13/16	1	.41	1.03	1.38	1.47
10TTM8[ ]	5/8	1/2	2.94	1	13/16	1	.50	1.03	1.38	1.47
12TTM8[ ]	3/4	1/2	3.23	1 1/8	1	1	.69	1.16	1.50	1.61
12TTM12[ ]	3/4	3/4	3.19	1 1/8	1	1	.66	1.16	1.50	1.59
14TTM12[ ]	7/8	3/4	3.44	1 1/4	1 1/4	1.06	.72	1.28	1.50	1.72
16TTM12[ ]	1	3/4	3.75	1 1/2	1 1/4	1.31	.72	1.31	1.66	1.88
16TTM16[ ]	1	1	3.75	1 1/2	1 1/4	1.31	.88	1.31	1.84	1.88

## Male Branch Tee: TTM/ME

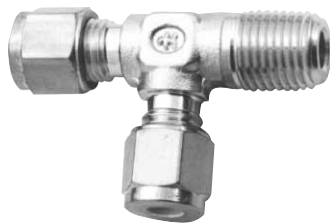
connects **metric** tube to female NPT threads

Part Number*	T P		Dimensions — mm							
	Tube O.D.	Male Pipe Thd.	A	B Hex Flat	C	D	E	G	H	M
3TTM2[ ]ME	3	1/8	49.4	11.1	11.1	14.3	2.2	16.8	18.3	24.7
4TTM2[ ]ME	4	1/8	50.7	12.7	11.1	15.1	2.3	17.5	19.1	25.4
4TTM4[ ]ME	4	1/4	50.7	12.7	12.7	15.1	2.3	17.5	21.3	25.4
6TTM2[ ]ME	6	1/8	53.3	14.3	11.1	16.3	3.8	18.3	19.8	26.7
6TTM4[ ]ME	6	1/4	56.3	14.3	12.7	16.3	3.8	19.8	26.2	28.2
6TTM6[ ]ME	6	3/8	61.4	14.3	17.5	16.3	3.8	22.4	28.7	30.7
8TTM2[ ]ME	8	1/8	57.2	15.9	12.7	16.7	4.7	20.6	20.6	28.6
8TTM4[ ]ME	8	1/4	57.2	15.9	12.7	16.7	5.9	20.6	25.4	28.6
8TTM6[ ]ME	8	3/8	62.2	15.9	17.5	16.7	5.9	23.1	28.7	31.1
8TTM8[ ]ME	8	1/2	68.3	15.9	20.7	16.7	5.9	26.2	33.3	34.2
10TTM2[ ]ME	10	1/8	65.2	19.1	17.5	17.5	4.7	24.6	25.4	32.6
10TTM4[ ]ME	10	1/4	65.2	19.1	12.7	17.5	7.5	24.6	25.4	32.6
10TTM6[ ]ME	10	3/8	65.2	19.1	17.5	17.5	8.0	24.6	28.7	32.6
10TTM8[ ]ME	10	1/2	68.3	19.1	20.7	17.5	8.0	26.2	33.3	34.1
12TTM4[ ]ME	12	1/4	73.2	22.2	17.5	24.6	7.5	24.6	28.7	36.6
12TTM6[ ]ME	12	3/8	73.2	22.2	17.5	24.6	10.0	24.6	28.7	36.6
12TTM8[ ]ME	12	1/2	76.2	22.2	20.7	24.6	10.0	26.2	33.3	38.1

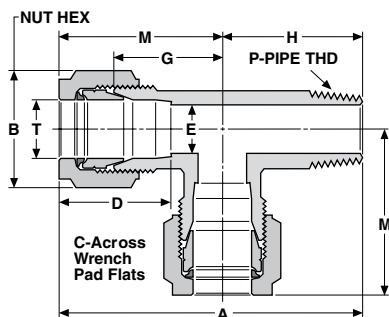
\* [ ] see page 6 for material specifications.

## Male Run Tee: TMT

connects **fractional** tube to female NPT thread



Metric fitting shown



Part Number*	T		Dimensions — inches							
	Tube O.D.	Male NPT Size	A	B Hex Flat	C	D	E	G	H	M
1TMT1[ ]	1/16	1/16	1.50	5/16	7/16	.41	.05	.56	.72	.78
2TMT2[ ]	1/8	1/8	1.69	7/16	7/16	.56	.09	.66	.72	.97
3TMT2[ ]	3/16	1/8	1.75	1/2	7/16	.59	.13	.69	.75	1
4TMT2[ ]	1/4	1/8	1.83	9/16	7/16	.64	.19	.72	.78	1.05
4TMT4[ ]	1/4	1/4	2.13	9/16	1/2	.64	.19	.78	1.02	1.11
6TMT4[ ]	3/8	1/4	2.19	11/16	1/2	.72	.30	.84	1	1.19
6TMT6[ ]	3/8	3/8	2.42	11/16	11/16	.72	.30	.94	1.13	1.30
8TMT6[ ]	1/2	3/8	2.56	7/8	11/16	.99	.42	.97	1.13	1.44
8TMT8[ ]	1/2	1/2	2.81	7/8	13/16	.99	.42	1.03	1.31	1.50
10TMT8[ ]	5/8	1/2	2.84	1	13/16	1	.50	1.03	1.38	1.47
12TMT12[ ]	3/4	3/4	3.09	1 1/8	1	1	.66	1.16	1.50	1.59
14TMT12[ ]	7/8	3/4	3.22	1 1/4	1 1/4	1.06	.72	1.28	1.50	1.72
16TMT12[ ]	1	3/4	3.53	1 1/2	1 1/4	1.31	.72	1.31	1.66	1.88
16TMT16[ ]	1	1	3.72	1 1/2	1 1/4	1.31	.88	1.31	1.84	1.88

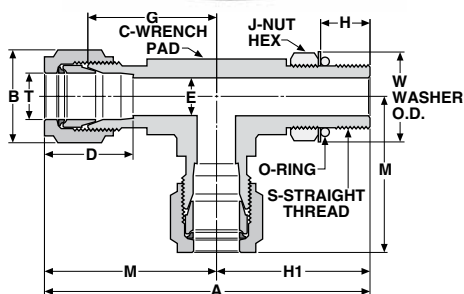
## Male Run Tee: TMT/ME

connects **metric** tube to female NPT threads

Part Number*	T		Dimensions — mm							
	Tube O.D.	Pipe Thd.	A	B Hex Flat	C	D	E	G	H	M
3TMT2[ ]ME	3	1/8	43.0	11.1	11.1	14.3	2.2	16.8	18.3	24.7
6TMT2[ ]ME	6	1/8	46.4	14.3	11.1	16.3	3.8	18.2	17.8	26.6
6TMT4[ ]ME	6	1/4	54.1	14.3	12.7	16.3	3.8	19.8	25.9	28.2
6TMT6[ ]ME	6	3/8	59.4	14.3	17.5	16.3	3.8	22.4	28.7	30.7
6TMT8[ ]ME	6	1/2	67.0	14.3	20.7	16.3	3.8	25.4	33.3	33.8
8TMT2[ ]ME	8	1/8	49.3	15.9	12.7	16.7	4.7	20.6	20.6	28.6
8TMT4[ ]ME	8	1/4	58.0	15.9	17.5	16.7	5.9	21.6	25.4	32.6
10TMT2[ ]ME	10	1/8	58.0	19.1	17.5	17.5	4.7	24.6	25.4	32.6
10TMT4[ ]ME	10	1/4	61.1	19.1	17.5	17.5	7.5	24.6	25.4	32.6
10TMT6[ ]ME	10	3/8	61.3	19.1	17.5	17.5	8.0	24.6	28.7	32.6
12TMT4[ ]ME	12	1/4	61.9	22.2	17.5	24.6	7.5	24.6	25.4	36.5
12TMT8[ ]ME	12	1/2	71.5	22.2	19.8	24.6	10.0	26.2	33.3	38.2

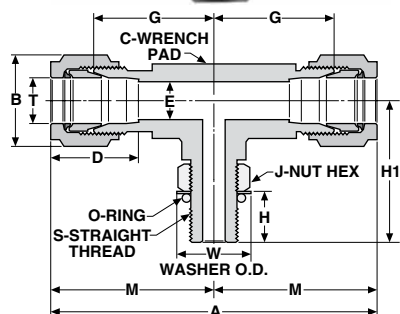
## Tee, SAE Run, Positionable: TST

connects **fractional** tube to SAE straight thread boss



Part Number*	T		Dimensions — inches										O-ring Uniform Size #	
	Tube O.D.	S	A	B	C	D	E	G	H	H1	J Hex Flat	M		W
4TST4[ ]	1/4	7/16-20	2.13	9/16	.50	.64	.19	.78	.39	1.03	9/16	1.11	.66	904
6TST6[ ]	3/8	9/16-18	2.63	11/16	.81	.72	.30	1.03	.44	1.25	11/16	1.38	.80	906
8TST8[ ]	1/2	3/4-16	3.05	7/8	1	.97	.42	1.13	.50	1.45	7/8	1.59	1.02	908
12TST12[ ]	3/4	1 1/16-12	3.63	1 1/8	1.25	1	.66	1.25	.66	1.94	1 1/4	1.69	1.44	912
16TST16[ ]	1	1 5/16-12	3.92	1 7/8	1.25	1.31	.88	1.31	.66	2.05	1 1/2	1.88	1.73	916

To specify O-ring material for SAE fittings, see page 6



## Tee, SAE Branch, Positionable: TTS

connects **fractional** tube to SAE straight thread boss

Part Number*	T		Dimensions — inches										O-ring Uniform Size #	
	Tube O.D.	S	A	B	C	D	E	G	H	H1	J Hex Flat	M		W
4TTS4[ ]	1/4	7/16-20	2.22	9/16	.50	.64	.19	.78	.39	1.03	9/16	1.11	.66	904
6TTS6[ ]	3/8	9/16-18	2.75	11/16	.81	.72	.30	1.03	.44	1.25	11/16	1.38	.80	906
8TTS8[ ]	1/2	3/4-16	3.19	7/8	1	.97	.42	1.13	.50	1.45	7/8	1.59	1.02	908
12TTS12[ ]	3/4	1 1/16-12	3.38	1 1/8	1.25	1	.66	1.25	.66	1.94	1 1/4	1.69	1.44	912
16TTS16[ ]	1	1 5/16-12	3.75	1 7/8	1.25	1.31	.88	1.31	.66	2.05	1 1/2	1.88	1.73	916

\* [ ] see page 6 for material specifications.

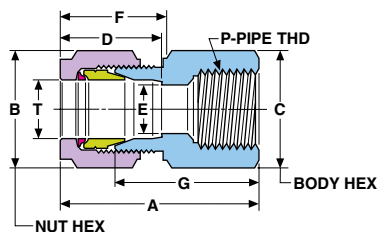
## Female Connector: CF

connects fractional tube to male NPT threads

Part Number*	T		P		Dimensions – inches					
	Tube O.D.	Female NPT Size	A	Hex Flat	B Hex Flat	C Hex Flat	D	E	F	G
1CF1[ ]	1/16	1/16	1	5/16	7/16	.41	.05	.48	.78	
1CF2[ ]	1/16	1/8	1.03	5/16	9/16	.41	.05	.48	.81	
2CF2[ ]	1/8	1/8	1.19	7/16	9/16	.56	.09	.67	.88	
2CF4[ ]	1/8	1/4	1.38	7/16	3/4	.56	.09	.67	1.06	
3CF2[ ]	3/16	1/8	1.22	1/2	9/16	.59	.13	.70	.91	
3CF4[ ]	3/16	1/4	1.41	1/2	3/4	.59	.13	.70	1.09	
4CF2[ ]	1/4	1/8	1.25	9/16	9/16	.69	.19	.77	.94	
4CF4[ ]	1/4	1/4	1.44	9/16	3/4	.69	.19	.77	1.13	
4CF6[ ]	1/4	3/8	1.50	9/16	7/8	.69	.19	.77	1.19	
4CF8[ ]	1/4	1/2	1.70	9/16	1 1/16	.69	.19	.77	1.38	
6CF2[ ]	3/8	1/8	1.34	11/16	5/8	.72	.30	.83	1	
6CF4[ ]	3/8	1/4	1.53	11/16	3/4	.72	.30	.83	1.19	
6CF6[ ]	3/8	3/8	1.59	11/16	7/8	.72	.30	.83	1.25	
6CF8[ ]	3/8	1/2	1.78	11/16	1 1/16	.72	.30	.83	1.44	
6CF12[ ]	3/8	3/4	1.92	11/16	1 1/4	.72	.30	.83	1.56	
8CF4[ ]	1/2	1/4	1.72	7/8	13/16	.97	.42	.92	1.25	
8CF6[ ]	1/2	3/8	1.72	7/8	7/8	.97	.42	.92	1.25	
8CF8[ ]	1/2	1/2	1.91	7/8	1 1/16	.97	.42	.92	1.44	
8CF12[ ]	1/2	3/4	2.06	7/8	1 1/4	.97	.42	.92	1.59	
8CF16[ ]	1/2	1	2.50	7/8	1 5/8	.97	.42	.92	1.94	
10CF6[ ]	5/8	3/8	1.69	1	15/16	1	.50	.92	1.25	
10CF8[ ]	5/8	1/2	1.88	1	1 1/16	1	.50	.92	1.44	
12CF8[ ]	3/4	1/2	1.94	1 1/8	1 1/16	1	.66	.97	1.25	
12CF12[ ]	3/4	3/4	2	1 1/8	1 1/4	1	.66	.97	1.56	
14CF12[ ]	7/8	3/4	2	1 1/4	1 1/4	1.06	.72	.97	1.56	
16CF12[ ]	1	3/4	2.19	1 1/2	1 3/8	1.31	.88	1.08	1.63	
16CF16[ ]	1	1	2.53	1 1/2	1 5/8	1.31	.88	1.08	1.97	
20CF20[ ]	1 1/4	1 1/4	2.98	1 7/8	2 1/8	1.62	1.09	1.53	1	
24CF24[ ]	1 1/2	1 1/2	3.28	2 1/4	2 3/8	1.97	1.34	1.78	1.09	
32CF32[ ]	2	2	4	3	2 7/8	2.66	1.81	2.47	1.12	



Metric fitting shown



## Female Connector: CF/ME

connects metric tube to male NPT threads

Part Number*	T		P		Dimensions – mm					
	Tube O.D.	Female NPT Size	A	Hex Flat	B Hex Flat	C	D	E	F	G
3CF2[ ]ME	3	1/8	32.1	11.1	14.5	14.3	2.2	17.1	24.1	
3CF4[ ]ME	3	1/4	34.9	11.1	19.1	14.3	2.2	17.1	27.0	
6CF2[ ]ME	6	1/8	31.9	14.3	14.5	16.3	3.8	19.5	23.9	
6CF4[ ]ME	6	1/4	36.4	14.3	19.1	16.3	3.8	19.5	28.5	
6CF6[ ]ME	6	3/8	39.6	14.3	22.2	16.3	3.8	19.5	31.2	
6CF8[ ]ME	6	1/2	43.3	14.3	27.0	16.3	3.8	19.5	35.0	
8CF2[ ]ME	8	1/8	32.6	15.9	14.3	16.7	5.8	19.1	24.6	
8CF4[ ]ME	8	1/4	37.4	15.9	19.1	16.7	5.8	19.1	29.4	
8CF6[ ]ME	8	3/8	38.2	15.9	22.2	16.7	5.8	19.1	30.2	
8CF8[ ]ME	8	1/2	44.5	15.9	27.0	16.7	5.8	19.1	36.5	
10CF2[ ]ME	10	1/8	33.4	19.1	17.5	17.5	7.9	19.8	25.4	
10CF4[ ]ME	10	1/4	38.1	19.1	19.1	17.5	7.9	19.8	30.2	
10CF6[ ]ME	10	3/8	39.7	19.1	22.2	17.5	7.9	19.8	31.8	
10CF8[ ]ME	10	1/2	44.5	19.1	27.0	17.5	7.9	19.8	36.5	
12CF4[ ]ME	12	1/4	43.7	22.2	20.6	24.6	9.9	23.4	31.8	
12CF6[ ]ME	12	3/8	43.7	22.2	20.6	24.6	9.9	23.4	31.8	
12CF8[ ]ME	12	1/2	48.5	22.2	27.0	24.6	9.9	23.4	36.5	
12CF12[ ]ME	12	3/4	52.4	22.2	31.8	24.6	9.9	23.4	40.5	
14CF4[ ]ME	14	1/4	41.1	23.8	23.8	22.2	11.9	21.0	31.2	
14CF8[ ]ME	14	1/2	45.9	23.8	27.0	22.2	11.9	21.0	36.5	
15CF8[ ]ME	15	1/2	46.3	23.8	27.0	22.2	12.7	21.8	36.0	
16CF8[ ]ME	16	1/2	47.7	25.4	27.0	25.0	12.7	23.4	36.5	
16CF12[ ]ME	16	3/4	53.0	25.4	32.0	25.0	12.7	23.4	41.0	
18CF8[ ]ME	18	1/2	48.1	28.6	27.0	25.4	15.8	24.6	38.1	
18CF12[ ]ME	18	3/4	49.8	28.6	31.8	25.4	15.8	24.6	39.9	
20CF8[ ]ME	20	1/2	52.5	31.8	30.2	31.0	16.7	27.0	38.6	
20CF12[ ]ME	20	3/4	53.5	31.8	31.8	31.0	16.7	27.0	39.6	
22CF8[ ]ME	22	1/2	49.3	31.8	33.3	27.0	17.8	24.6	38.1	
22CF12[ ]ME	22	3/4	53.8	31.8	33.3	27.0	17.8	24.6	42.7	
22CF16[ ]ME	22	1	61.0	31.8	41.5	27.0	17.8	24.6	50.0	
25CF8[ ]ME	25	1/2	55.8	38.1	34.9	33.3	11.9	27.4	41.4	
25CF12[ ]ME	25	3/4	56.0	38.1	35.0	33.3	21.7	27.4	41.0	
25CF16[ ]ME	25	1	64.4	38.1	41.3	33.3	21.7	27.4	50.0	

\* [ ] see page 6 for material specifications.

## Female Connector: CF/EZ

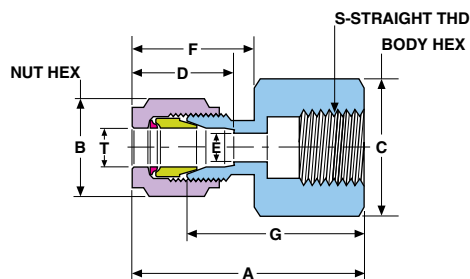
connects **fractional** tube with RG parallel threads

Part Number*	T		Dimensions — inches								
	Tube O.D.	S Thd. Size	A	B		C		D	E	F	G
2CF2[ ]EZ	1/8	1/8	1.33	7/16	5/8	.56	.09	.67	1.02		
2CF4[ ]EZ	1/8	1/4	1.45	7/16	3/4	.56	.09	.67	1.14		
4CF[ ]EZ	1/4	1/4	1.50	9/16	3/4	.64	.19	.77	1.17		
4CF8[ ]EZ	1/4	1/2	1.89	9/16	1 1/16	.64	.19	.77	1.56		
6CF4[ ]EZ	3/8	1/4	1.55	11/16	3/4	.72	.22	.83	1.20		
6CF8[ ]EZ	3/8	1/2	1.78	11/16	1 1/16	.72	.28	.83	1.44		
8CF4[ ]EZ	1/2	1/4	1.80	7/8	13/16	.97	.22	.92	1.33		
8CF8[ ]EZ	1/2	1/2	2.05	7/8	1 1/16	.97	.28	.92	1.58		

RG female thread ends require a gasket inserted into the flat bottom of the thread. The male end, when assembled, exerts pressure on the gasket, creating a seal.



Fractional fitting shown



## Female Connector: CF/MZ

connects **metric** tube with RG parallel threads

Part Number*	T		Dimensions — mm								
	Tube O.D.	S Thd. Size	A	B		C		D	E	F	G
3CF4[ ]MZ	3	1/4	38.1	11.1	19.0	14.3	2.4	17.1	30.1		
6CF4[ ]MZ	6	1/4	39.0	14.3	22.2	16.3	4.0	19.5	30.7		
6CF8[ ]MZ	6	1/2	45.3	14.3	27.0	16.3	4.0	19.5	40.0		
8CF4[ ]MZ	8	1/4	35.6	15.9	19.1	16.7	5.9	19.1	27.6		
8CF8[ ]MZ	8	1/2	44.8	15.9	27.0	16.7	5.9	19.1	36.8		
10CF4[ ]MZ	10	1/4	36.4	19.1	19.1	17.5	5.5	19.8	28.4		
10CF8[ ]MZ	10	1/2	44.9	19.1	27.0	17.5	7.0	19.8	36.9		
12CF4[ ]MZ	12	1/4	46.4	22.2	22.2	24.6	5.5	23.4	34.4		
12CF8[ ]MZ	12	1/2	52.3	22.2	27.0	24.6	7.0	23.4	40.4		
14CF8[ ]MZ	14	1/2	49.2	23.8	27.0	22.2	7.0	21.0	39.8		
16CF8[ ]MZ	16	1/2	55.5	25.4	27.0	25.0	7.0	23.4	44.4		
18CF8[ ]MZ	18	1/2	56.2	28.6	30.2	25.4	7.0	24.6	46.3		
20CF8[ ]MZ	20	1/2	59.3	31.8	30.2	31.0	7.0	27.0	45.5		
22CF8[ ]MZ	22	1/2	56.6	31.8	30.2	27.0	7.0	24.6	45.4		
25CF8[ ]MZ	25	1/2	64.9	38.1	34.9	33.3	7.0	27.4	50.5		

\* [ ] see page 6 for material specifications.

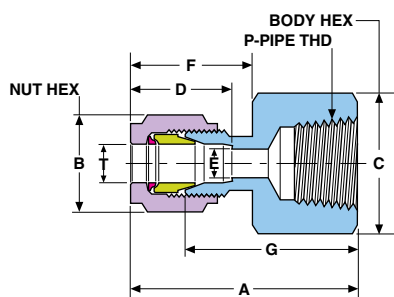
## Female Connector: CF/EC

connects **fractional** tube with RT tapered threads



Fractional fitting shown

Part Number*	T Tube O.D.	P Pipe Thd.	Dimensions—Inches						
			A	B Hex Flat	C Hex Flat	D	E	F	G
4CF2[ ]EC	1/4	1/8	1.25	9/16	9/16	.64	.19	.77	.94
4CF4[ ]EC	1/4	1/4	1.44	9/16	3/4	.64	.19	.77	1.13
4CF6[ ]EC	1/4	3/8	1.50	9/16	7/8	.64	.19	.77	1.19
4CF8[ ]EC	1/4	1/2	1.70	9/16	1 1/16	.64	.19	.77	1.38
6CF4[ ]EC	3/8	1/4	1.53	11/16	3/4	.72	.30	.83	1.19
6CF6[ ]EC	3/8	3/8	1.59	11/16	7/8	.72	.30	.83	1.25
6CF8[ ]EC	3/8	1/2	1.78	11/16	1 1/16	.72	.30	.83	1.44
8CF4[ ]EC	1/2	1/4	1.72	7/8	13/16	.97	.42	.92	1.25
8CF6[ ]EC	1/2	3/8	1.72	7/8	7/8	.97	.42	.92	1.25
8CF8[ ]EC	1/2	1/2	1.91	7/8	1 1/16	.97	.42	.92	1.44
10CF8[ ]EC	5/8	1/2	1.88	1	1 1/16	1	.50	.92	1.44



## Female Connector: CF/MC

connects **metric** tube with RT tapered threads

Part Number*	T Tube O.D.	P Pipe Thd.	Dimensions—mm						
			A	B Hex Flat	C Hex Flat	D	E	F	G
3CF2[ ]MC	3	1/8	32.1	11.1	14.5	14.3	2.2	17.1	24.1
3CF4[ ]MC	3	1/4	34.9	11.1	19.1	14.3	2.2	17.1	27.0
6CF2[ ]MC	6	1/8	31.9	14.3	14.5	16.3	3.8	19.5	23.9
6CF4[ ]MC	6	1/4	36.4	14.3	19.1	16.3	3.8	19.5	28.5
6CF6[ ]MC	6	3/8	39.6	14.3	22.2	16.3	3.8	19.5	31.2
6CF8[ ]MC	6	1/2	43.3	14.3	27.0	16.3	3.8	19.5	35.0
8CF2[ ]MC	8	1/8	32.6	15.9	14.3	16.7	5.8	19.1	24.6
8CF4[ ]MC	8	1/4	37.4	15.9	19.1	16.7	5.8	19.1	29.4
8CF6[ ]MC	8	3/8	38.2	15.9	22.2	16.7	5.8	19.1	30.2
8CF8[ ]MC	8	1/2	44.5	15.9	27.0	16.7	5.8	19.1	36.5
10CF2[ ]MC	10	1/8	33.4	19.1	17.5	17.5	7.9	19.8	25.4
10CF4[ ]MC	10	1/4	38.1	19.1	19.1	17.5	7.9	19.8	30.2
10CF6[ ]MC	10	3/8	39.7	19.1	22.2	17.5	7.9	19.8	31.8
10CF8[ ]MC	10	1/2	44.5	19.1	27.0	17.5	7.9	19.8	36.5
12CF4[ ]MC	12	1/4	43.7	22.2	20.6	24.6	9.9	23.4	31.8
12CF6[ ]MC	12	3/8	43.7	22.2	20.6	24.6	9.9	23.4	31.8
12CF8[ ]MC	12	1/2	48.5	22.2	27.0	24.6	9.9	23.4	36.5
12CF12[ ]MC	12	3/4	52.4	22.2	31.8	24.6	9.9	23.4	40.5
14CF4[ ]MC	14	1/4	41.1	23.8	23.8	22.2	11.9	21.0	31.2
14CF8[ ]MC	14	1/2	45.9	23.8	27.0	22.2	11.9	21.0	36.5
15CF8[ ]MC	15	1/2	46.3	23.8	27.0	22.2	12.7	21.8	36.0
16CF8[ ]MC	16	1/2	47.7	25.4	27.0	25.0	12.7	23.4	36.5
16CF12[ ]MC	16	3/4	53.0	25.4	32.0	25.0	12.7	23.4	41.0
18CF8[ ]MC	18	1/2	48.1	28.6	27.0	25.4	15.8	24.6	38.1
18CF12[ ]MC	18	3/4	49.8	28.6	31.8	25.4	15.8	24.6	39.9
20CF8[ ]MC	20	1/2	52.5	31.8	30.2	31.0	16.7	27.0	38.6
20CF12[ ]MC	20	3/4	53.5	31.8	31.8	31.0	16.7	27.0	39.6
22CF8[ ]MC	22	1/2	49.3	31.8	33.3	27.0	17.8	24.6	38.1
22CF12[ ]MC	22	3/4	53.8	31.8	33.3	27.0	17.8	24.6	42.7
22CF16[ ]MC	22	1	61.0	31.8	41.5	27.0	17.8	24.6	50.0
25CF8[ ]MC	25	1/2	55.8	38.1	34.9	33.3	11.9	27.4	41.4
25CF12[ ]MC	25	3/4	56.0	38.1	35.0	33.3	21.7	27.4	41.0
25CF16[ ]MC	25	1	64.4	38.1	41.3	33.3	21.7	27.4	50.0

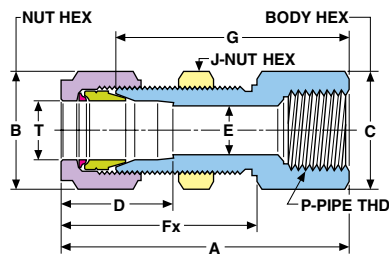
## Bulkhead Connector, Female: BCF

connects **fractional** tube to male NPT thread

Part Number*	T Tube O.D.	P Male NPT Size	Dimensions — inches									Panel Hole Size	Max. Panel Thickness
			A	B Hex Flat	C Hex Flat	D	E	Fx	G	J Hex Flat			
2BCF2[ ]	1/8	1/8	1.81	7/16	9/16	.56	.09	1.28	1.50	1/2	.33	.44	
4BCF2[ ]	1/4	1/8	1.89	9/16	5/8	.64	.19	1.36	1.56	5/8	.45	.47	
4BCF4[ ]	1/4	1/4	2.08	9/16	3/4	.64	.19	1.40	1.75	5/8	.45	.47	
6BCF2[ ]	3/8	1/8	2.22	11/16	3/4	.72	.30	1.50	1.88	3/4	.58	.53	
6BCF4[ ]	3/8	1/4	2.22	11/16	3/4	.72	.30	1.50	1.88	3/4	.58	.53	
6BCF6[ ]	3/8	3/8	2.28	11/16	7/8	.72	.30	1.50	.94	3/4	.58	.53	
8BCF4[ ]	1/2	1/4	2.44	7/8	15/16	.97	.42	1.72	1.97	15/16	.77	.59	
8BCF6[ ]	1/2	3/8	2.50	7/8	15/16	.97	.42	1.72	2.03	15/16	.77	.59	
8BCF8[ ]	1/2	1/2	2.69	7/8	1 1/16	.97	.42	1.72	2.22	15/16	.77	.59	
10BCF8[ ]	5/8	1/2	2.69	1	1 1/16	1	.50	1.72	2.25	1 1/16	.89	.56	



Metric fitting shown



## Bulkhead Connector, Female: BCF/ME

connects **metric** tube to male NPT threads

Part Number*	T Tube O.D.	P Male NPT Size	Dimensions — mm									Panel Hole Size	Max. Panel Thickness
			A	B Hex Flat	C Hex Flat	D	E	Fx	G	J Hex Flat			
3BCF2[ ]ME	3	1/8	46.0	11.1	14.5	14.3	2.5	32.5	38.0	12.7	8.3	12.0	
6BCF2[ ]ME	6	1/8	48.0	14.3	14.3	16.3	3.9	34.6	39.6	15.9	11.5	13.0	
6BCF4[ ]ME	6	1/4	53.8	14.3	19.1	16.3	3.9	34.6	45.5	15.9	11.5	13.0	
8BCF4[ ]ME	8	1/4	55.0	15.9	17.5	16.7	6.0	36.5	47.0	17.5	13.1	14.0	
10BCF4[ ]ME	10	1/4	55.6	19.1	19.1	17.5	7.9	37.3	47.6	19.1	16.5	14.0	
12BCF6[ ]ME	12	3/8	63.0	22.2	24.0	24.6	10.0	44.0	52.0	23.8	19.5	16.0	
12BCF8[ ]ME	12	1/2	68.3	22.2	26.9	24.6	9.9	43.7	56.4	23.8	19.5	16.0	
14BCF8[ ]ME	14	1/2	68.0	23.8	24.0	22.2	12.0	41.1	56.0	23.8	19.5	16.0	
16BCF8[ ]ME	16	1/2	68.3	25.4	26.9	25.0	12.6	43.7	57.2	27.0	22.5	14.0	
18BCF8[ ]ME	18	1/2	72.0	28.6	30.0	25.4	12.6	48.0	61.0	30.2	26.0	17.0	
22BCF8[ ]ME	22	1/2	77.0	31.8	33.5	27.0	12.6	53.0	65.0	33.3	29.5	24.0	
25BCF8[ ]ME	25	1/2	84.0	38.1	40.0	33.3	12.6	60.0	70.0	39.7	33.8	24.0	

\* [ ] see page 6 for material specifications.

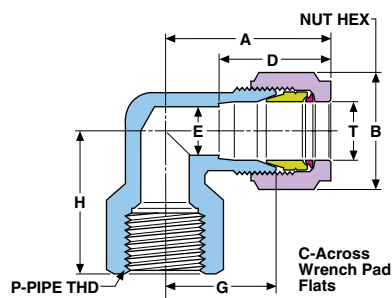
## Female Elbow: LF

connects **fractional** tube to male NPT threads

Part Number*	T P		Dimensions — inches						
	Tube O.D.	Pipe Size	A	B Hex Flat	C	D	E	G	H
1LF1[ ]	1/16	1/16	.78	5/16	7/16	.41	.05	.56	.75
1LF2[ ]	1/16	1/8	.84	5/16	1/2	.41	.05	.63	.75
2LF2[ ]	1/8	1/8	1	7/16	1/2	.56	.09	.69	.75
2LF4[ ]	1/8	1/4	1.13	7/16	11/16	.56	.09	.81	.84
3LF2[ ]	3/16	1/8	1.03	1/2	1/2	.59	.13	.72	.75
4LF2[ ]	1/4	1/8	1.08	9/16	1/2	.64	.19	.75	.81
4LF4[ ]	1/4	1/4	1.20	9/16	11/16	.64	.19	.88	.84
4LF6[ ]	1/4	3/8	1.33	9/16	13/16	.64	.19	1	.84
4LF8[ ]	1/4	1/2	1.45	9/16	1	.64	.19	1.13	1.13
6LF2[ ]	3/8	1/8	1.81	11/16	1/2	.72	.30	.84	.69
6LF4[ ]	3/8	1/4	1.28	11/16	11/16	.72	.30	.94	.84
6LF6[ ]	3/8	3/8	1.38	11/16	13/16	.72	.30	1.03	.84
6LF8[ ]	3/8	1/2	1.48	11/16	1	.72	.30	1.13	1.13
8LF4[ ]	1/2	1/4	1.44	7/8	11/16	.97	.42	.97	.91
8LF6[ ]	1/2	3/8	1.50	7/8	13/16	.97	.42	1.03	.91
8LF8[ ]	1/2	1/2	1.59	7/8	1	.97	.42	1.13	1.13
8LF12[ ]	1/2	3/4	1.66	7/8	1 1/4	.97	.42	1.19	1.25
10LF6[ ]	5/8	3/8	1.47	1	13/16	1	.50	1.03	.91
10LF8[ ]	5/8	1/2	1.56	1	1	1	.50	1.13	1.13
12LF8[ ]	3/4	1/2	1.59	1 1/8	1	1	.66	1.16	1.13
12LF12[ ]	3/4	3/4	1.34	1 1/8	1 1/4	1	.66	1.25	1.25
14LF12[ ]	7/8	3/4	1.69	1 1/4	1 1/4	1.06	.72	1.25	1.25
16LF12[ ]	1	3/4	1.88	1 1/2	1 1/4	1.31	.88	1.31	1.25
16LF16[ ]	1	1	2.06	1 1/2	1 11/16	1.31	.88	1.50	1.50



Metric fitting shown



## Female Elbow: LF/ME, LF/MC

connects **metric** tube to male NPT or RT tapered threads

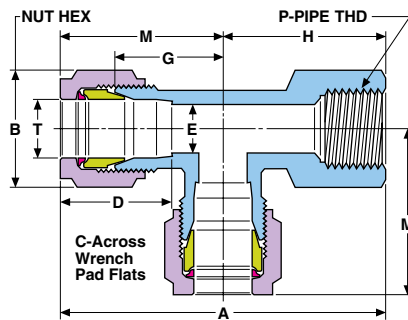
Part Number*	T P		Dimensions—mm							
	NPT Threads	RT Threads	Tube O.D.	Pipe Size	A	B Hex Flat	C	D	E	G
3LF2[ ]ME	3LF2[ ]MC	3	1/8	25.5	11.1	12.6	14.3	2.2	17.5	17.1
3LF4[ ]ME	3LF4[ ]MC	3	1/4	25.0	11.1	12.6	14.3	2.3	17.5	21.5
4LF4[ ]ME	4LF4[ ]MC	4	1/4	30.2	12.7	17.3	15.1	2.3	22.4	21.3
6LF2[ ]ME	6LF2[ ]MC	6	1/8	27.4	14.3	12.6	16.3	3.8	19.1	20.6
6LF4[ ]ME	6LF4[ ]MC	6	1/4	30.7	14.3	17.3	16.3	3.8	22.4	21.3
6LF6[ ]ME	6LF6[ ]MC	6	3/8	33.8	14.3	20.5	16.3	3.8	25.4	21.3
6LF8[ ]ME	6LF8[ ]MC	6	1/2	37.1	14.3	25.3	16.3	3.8	28.7	28.7
8LF2[ ]ME	8LF2[ ]MC	8	1/8	27.8	15.9	12.6	16.7	5.8	19.8	16.0
8LF4[ ]ME	8LF4[ ]MC	8	1/4	31.1	15.9	17.3	16.7	5.8	23.1	22.4
8LF6[ ]ME	8LF6[ ]MC	8	3/8	29.0	15.9	20.5	16.7	5.8	23.1	23.1
10LF2[ ]ME	10LF2[ ]MC	10	1/8	31.9	19.1	17.3	17.5	7.9	23.9	21.3
10LF4[ ]ME	10LF4[ ]MC	10	1/4	31.9	19.1	17.3	17.5	7.9	23.9	21.3
10LF6[ ]ME	10LF6[ ]MC	10	3/8	34.1	19.1	20.5	17.5	7.9	26.2	21.3
10LF8[ ]ME	10LF8[ ]MC	10	1/2	36.7	19.1	25.3	17.5	7.9	28.7	28.7
12LF4[ ]ME	12LF4[ ]MC	12	1/4	36.6	22.2	17.3	24.6	7.5	24.6	21.3
12LF6[ ]ME	12LF6[ ]MC	12	3/8	38.1	22.2	20.5	24.6	9.9	26.2	23.1
12LF8[ ]ME	12LF8[ ]MC	12	1/2	40.6	22.2	25.3	24.6	9.9	28.7	28.7
14LF8[ ]ME	14LF8[ ]MC	14	1/2	37.0	23.8	21.0	22.2	12.0	25.0	28.5
16LF8[ ]ME	16LF8[ ]MC	16	1/2	40.9	25.4	25.3	25.0	12.7	29.7	28.7
18LF8[ ]ME	18LF8[ ]MC	18	1/2	39.4	28.6	25.3	25.4	15.8	29.5	28.7
18LF12[ ]ME	18LF12[ ]MC	18	3/4	41.7	28.6	31.6	25.4	15.8	31.8	31.8
22LF8[ ]ME	22LF8[ ]MC	22	1/2	44.0	31.8	25.3	27.0	17.9	29.5	28.5
22LF12[ ]ME	22LF12[ ]MC	22	3/4	44.0	31.8	31.6	27.0	17.9	33.5	32.0
25LF12[ ]ME	25LF12[ ]MC	25	3/4	47.5	38.1	31.6	33.3	21.7	33.5	32.0
25LF16[ ]ME	25LF16[ ]MC	25	1	52.0	38.1	38.5	33.3	21.7	38.0	38.0

## Female Run Tee: TFT

connects **fractional** tube to male NPT threads



Fractional fitting shown



Part Number*	T		P		Dimensions — inches						
	Tube O.D.	Pipe Size	A	Hex Flat	B	C	D	E	G	H	M
1TFT1 [ ]	1/16	1/16	1.53	5/16	7/16	.41	.05	.56	.75	.78	
2TFT2 [ ]	1/8	1/8	1.75	7/16	1/2	.56	.09	.69	.75	1	
3TFT2 [ ]	3/16	1/8	1.81	1/2	1/2	.59	.13	.75	.75	1.06	
4TFT2 [ ]	1/4	1/8	1.83	9/16	1/2	.64	.19	.75	.75	1.08	
4TFT4 [ ]	1/4	1/4	2.11	9/16	11/16	.64	.19	.94	.84	1.27	
6TFT4 [ ]	3/8	1/4	2.23	11/16	11/16	.72	.30	.94	.84	1.28	
6TFT6 [ ]	3/8	3/8	2.30	11/16	13/16	.72	.30	1.03	.91	1.39	
8TFT4 [ ]	1/2	1/4	2.41	7/8	11/16	.97	.42	.97	.97	1.44	
8TFT6 [ ]	1/2	3/8	2.53	7/8	13/16	.97	.42	1.03	.91	1.50	
8TFT8 [ ]	1/2	1/2	2.66	7/8	1	.97	.42	1.06	1.13	1.53	
10TFT8 [ ]	5/8	1/2	2.69	1	1	1	.50	1.13	1.13	1.56	
12TFT8 [ ]	3/4	1/2	2.73	1 1/8	1	1	.66	1.16	1.13	1.61	
12TFT12 [ ]	3/4	3/4	2.94	1 1/8	1 1/4	1	.66	1.25	1.25	1.69	
14TFT12 [ ]	7/8	3/4	2.94	1 1/4	1 1/4	1.06	.72	1.25	1.25	1.69	
16TFT12 [ ]	1	3/4	3.13	1 1/2	1 1/4	1.31	.88	1.94	1.25	1.88	
16TFT16 [ ]	1	1	3.56	1 1/2	1 11/16	1.31	.88	1.50	1.50	2.06	

## Female Run Tee: TFT/ME

connects **metric** tube to male NPT threads

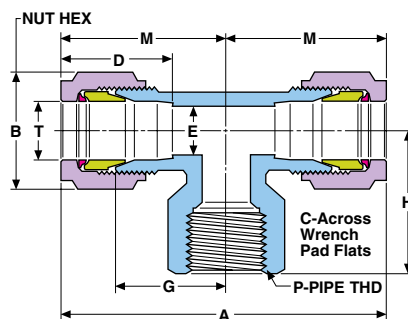
Part Number*	T		S		Dimensions — mm						
	Tube O.D.	Pipe Thd.	A	Hex Flat	B	C	D	E	G	H	M
3TFT2 [ ]ME	3	1/8	44.0	11.1	12.7	14.3	3.3	17.5	19.1	25.5	
6TFT2 [ ]ME	6	1/8	46.5	14.3	12.7	16.3	3.8	19.1	19.1	27.4	
6TFT4 [ ]ME	6	1/4	52.1	14.3	17.5	16.3	3.8	22.4	21.3	30.7	
6TFT8 [ ]ME	6	1/2	63.2	14.3	25.4	16.3	3.8	26.2	28.7	34.5	
10TFT2 [ ]ME	10	1/8	57.3	19.1	17.5	17.5	7.9	24.6	24.6	32.6	
10TFT4 [ ]ME	10	1/4	57.3	19.1	17.5	17.5	7.9	24.6	24.6	32.6	
10TFT6 [ ]ME	10	3/8	57.3	19.1	20.7	17.5	7.9	26.2	23.1	34.1	
10TFT8 [ ]ME	10	1/2	63.6	19.1	25.4	17.5	7.9	26.9	28.7	34.9	
12TFT4 [ ]ME	12	1/4	56.0	22.2	17.5	24.6	9.9	23.0	21.3	30.7	
12TFT8 [ ]ME	12	1/2	67.5	22.2	25.4	24.6	9.9	27.0	28.6	38.9	

## Female Branch Tee: TTF

connects **fractional** tube to male NPT threads



Fractional fitting shown



Part Number*	T		P		Dimensions — inches						
	Tube O.D.	Pipe Size	A	Hex Flat	B	C	D	E	G	H	M
1TTF1 [ ]	1/16	1/16	1.56	5/16	7/16	.41	.05	.56	.75	.78	
2TTF2 [ ]	1/8	1/8	2	7/16	1/2	.56	.09	.69	.75	1	
3TTF2 [ ]	3/16	1/8	2.13	1/2	1/2	.59	.13	.75	.75	1.06	
4TTF2 [ ]	1/4	1/8	2.16	9/16	1/2	.64	.19	.75	.75	1.08	
4TTF4 [ ]	1/4	1/4	2.53	9/16	11/16	.64	.19	.94	.84	1.27	
6TTF4 [ ]	3/8	1/4	2.56	11/16	11/16	.72	.30	.94	.84	1.28	
6TTF6 [ ]	3/8	3/8	2.78	11/16	13/16	.72	.30	1.03	.91	1.39	
6TTF8 [ ]	3/8	1/2	2.47	11/16	1	.72	.30	1.06	1.13	1.41	
8TTF4 [ ]	1/2	1/4	2.88	7/8	11/16	.97	.42	.97	.91	1.44	
8TTF6 [ ]	1/2	3/8	3	7/8	13/16	.97	.42	1.03	.91	1.50	
8TTF8 [ ]	1/2	1/2	3.06	7/8	1	.97	.42	1.06	1.13	1.53	
10TTF8 [ ]	5/8	1/2	3.13	1	1	1	.50	1.13	1.13	1.56	
12TTF8 [ ]	3/4	1/2	3.20	1 1/8	1	1	.66	1.16	1.13	1.61	
12TTF12 [ ]	3/4	3/4	3.38	1 1/8	1 1/4	1	.66	1.25	1.25	1.69	
14TTF12 [ ]	7/8	3/4	3.44	1 1/4	1 1/4	1.06	.72	1.25	1.25	1.72	
16TTF12 [ ]	1	3/4	3.75	1 1/2	1 1/4	1.31	.88	1.31	1.25	1.88	
16TTF16 [ ]	1	1	4.13	1 1/2	1 11/16	1.31	.88	1.50	1.50	2.06	

## Female Branch Tee: TTF/ME

connects **metric** tube to male NPT threads

Part Number*	T		P		Dimensions — mm						
	Tube O.D.	Pipe Thd.	A	Hex Flat	B	C	D	E	G	H	M
3TTF2 [ ]ME	3	1/8	51.0	11.1	12.7	14.3	2.3	17.5	19.1	25.5	
4TTF2 [ ]ME	4	1/8	50.7	12.7	12.7	15.1	2.3	17.5	19.1	25.4	
4TTF4 [ ]ME	4	1/4	60.3	12.7	17.5	15.1	2.3	22.4	21.3	30.2	
6TTF2 [ ]ME	6	1/8	54.8	14.3	12.7	16.3	3.8	19.1	19.1	27.4	
6TTF4 [ ]ME	6	1/4	61.4	14.3	17.5	16.3	3.8	22.4	21.3	30.7	
6TTF6 [ ]ME	6	3/8	67.5	14.3	20.7	16.3	3.8	25.4	23.1	33.8	
6TTF8 [ ]ME	6	1/2	69.0	14.3	25.4	16.3	3.8	26.2	28.7	34.5	
8TTF2 [ ]ME	8	1/8	55.6	15.9	12.7	16.7	5.8	19.8	19.1	27.8	
8TTF4 [ ]ME	8	1/4	62.2	15.9	17.5	16.7	5.8	23.1	22.4	31.1	
10TTF2 [ ]ME	10	1/8	62.2	19.1	17.5	17.5	7.9	24.6	23.1	32.6	
10TTF4 [ ]ME	10	1/4	62.2	19.1	17.5	17.5	7.9	24.6	23.1	32.6	
10TTF6 [ ]ME	10	3/8	68.3	19.1	20.7	17.5	7.9	26.2	23.1	34.1	
10TTF8 [ ]ME	10	1/2	69.8	19.1	25.4	17.5	7.9	26.9	28.7	34.9	
12TTF4 [ ]ME	12	1/4	73.0	22.2	20.7	24.6	10.0	24.6	23.1	36.6	
12TTF8 [ ]ME	12	1/2	81.3	22.2	25.4	24.6	10.0	28.7	28.7	40.6	
16TTF8 [ ]ME	16	1/2	81.7	25.4	25.4	25.0	12.7	29.7	28.7	40.9	

\* [ ] see page 6 for material specifications.

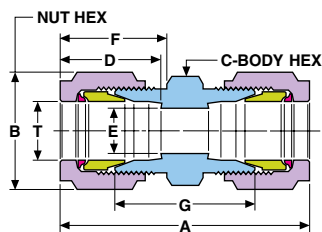


## Union: U

connects fractional tubes



Fractional fitting shown



Part Number*	T Tube O.D.	Dimensions — inches						
		A	B	C	D	E	F	G
1U [ ]	1/16	1.13	5/16	5/16	.41	.05	.48	.69
2U [ ]	1/8	1.50	7/16	7/16	.56	.09	.67	.88
3U [ ]	3/16	1.61	1/2	7/16	.59	.13	.70	.98
4U [ ]	1/4	1.75	9/16	1/2	.64	.19	.77	1.09
6U [ ]	3/8	1.89	11/16	5/8	.72	.30	.83	1.20
8U [ ]	1/2	2.16	7/8	13/16	.97	.42	.92	1.22
10U [ ]	5/8	2.16	1	15/16	1	.50	.92	1.28
12U [ ]	3/4	2.28	1 1/8	1 1/16	1	.66	.97	1.41
14U [ ]	7/8	2.28	1 1/4	1 3/16	1.06	.72	.97	1.41
16U [ ]	1	2.73	1 1/2	1 3/8	1.31	.88	1.08	1.59
20U [ ]	1 1/4	3.63	1 7/8	1 3/4	1.62	1.09	1.53	1.89
24U [ ]	1 1/2	4.25	2 1/4	2 1/8	1.97	1.34	1.78	2.11
32U [ ]	2	5.88	3	2 3/4	2.66	1.81	2.47	2.94

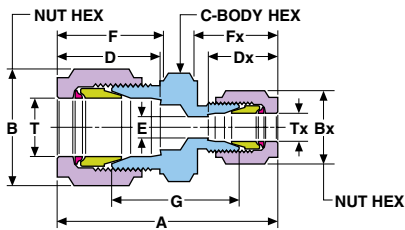
Part Number*	T Tube O.D.	Dimensions — mm						
		A	B Hex Flat	C Hex Flat	D	E	F	G
3U [ ]MM	3	40.8	11.1	11.1	14.3	2.2	17.1	24.9
4U [ ]MM	4	42.7	12.7	11.1	15.1	2.2	17.9	27.0
6U [ ]MM	6	45.7	14.3	12.7	16.3	3.8	19.5	28.9
8U [ ]MM	8	45.6	15.9	14.3	16.7	5.8	19.1	29.6
10U [ ]MM	10	46.9	19.1	17.5	17.5	7.9	19.8	30.9
12U [ ]MM	12	54.8	22.2	20.6	24.6	9.9	23.4	30.9
14U [ ]MM	14	50.5	23.8	22.2	22.2	11.9	21.0	31.8
15U [ ]MM	15	42.1	23.8	22.2	22.2	12.7	21.8	31.8
16U [ ]MM	16	54.8	25.4	23.8	25.0	12.7	23.4	32.5
18U [ ]MM	18	55.6	28.6	27.0	25.4	15.8	24.6	35.7
20U [ ]MM	20	63.5	31.8	30.2	31.0	16.7	27.0	35.8
22U [ ]MM	22	60.3	31.8	30.2	27.0	19.9	24.6	37.9
25U [ ]MM	25	69.3	38.1	34.9	33.3	21.7	27.4	40.5
30U [ ]MM	30	92.7	50.8	46	39.6	26.2	39.2	49.5
32U [ ]MM	32	97.3	50.8	46	42	28.6	41.6	51.3
38U [ ]MM	38	113.6	60.3	55	49.4	33.7	47.9	58.4

\* [ ] see page 6 for material specifications.

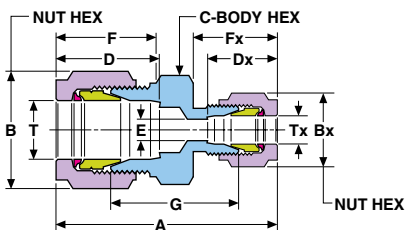
**Reducing Union: RU connects fractional tubes**


Fractional fitting shown

Part Number*	T Tube		Tx Tube		Dimensions — inches										
	O.D.	O.D.	A	Hex Flat	B	Hex Flat	Bx	Hex Flat	C	D	Dx	E	F	Fx	G
2RU1 [ ]	1/8	1/16	1.30	7/16	5/16	7/16	.56	.41	.05	.67	.48	.77			
3RU1 [ ]	3/16	1/16	1.34	1/2	5/16	7/16	.59	.41	.05	.70	.48	.81			
3RU2 [ ]	3/16	1/8	1.55	1/2	7/16	7/16	.59	.56	.09	.70	.67	.92			
4RU1 [ ]	1/4	1/16	1.48	9/16	5/16	1/2	.64	.41	.05	.77	.48	.94			
4RU2 [ ]	1/4	1/8	1.66	9/16	7/16	1/2	.64	.56	.09	.77	.67	1.02			
4RU3 [ ]	1/4	3/16	1.67	9/16	1/2	1/2	.64	.70	.13	.77	.70	1.03			
6RU1 [ ]	3/8	1/16	1.50	11/16	5/16	5/8	.72	.41	.05	.83	.48	.94			
6RU2 [ ]	3/8	1/8	1.77	11/16	7/16	5/8	.72	.56	.09	.83	.67	1.09			
6RU4 [ ]	3/8	1/4	1.83	11/16	9/16	5/8	.72	.64	.19	.83	.77	1.16			
8RU2 [ ]	1/2	1/8	1.94	7/8	7/16	13/16	.97	.56	.09	.92	.67	1.16			
8RU4 [ ]	1/2	1/4	1.95	7/8	9/16	13/16	.97	.64	.19	.92	.77	1.16			
8RU6 [ ]	1/2	3/8	2.03	7/8	11/16	13/16	.97	.72	.30	.92	.83	1.22			
10RU6 [ ]	5/8	3/8	2.05	1	11/16	15/16	1	.72	.30	.92	.83	1.25			
10RU8 [ ]	5/8	1/2	2.16	1	7/8	15/16	1	.97	.42	.92	.92	1.25			
12RU4 [ ]	3/4	1/4	2.16	1 1/8	9/16	1 1/16	1	.64	.19	.97	.77	1.36			
12RU6 [ ]	3/4	3/8	2.22	1 1/8	11/16	1 1/16	1	.72	.30	.97	.83	1.41			
12RU8 [ ]	3/4	1/2	2.25	1 1/8	7/8	1 1/16	1	.97	.42	.97	.92	1.34			
12RU10 [ ]	3/4	5/8	2.25	1 1/8	1	1 1/16	1	1	.50	.97	.92	1.38			
14RU12 [ ]	7/8	3/4	2.33	1 1/4	1 1/8	1 3/16	1.06	1	.66	.97	.97	1.44			
16RU8 [ ]	1	1/2	2.61	1 1/2	7/8	1 3/8	1.31	.97	.42	1.08	.92	1.56			
16RU12 [ ]	1	3/4	2.55	1 1/2	1 1/8	1 3/8	1.31	1	.66	1.08	.97	1.53			
16RU14 [ ]	1	7/8	2.58	1 1/2	1 1/4	1 3/8	1.31	1.06	.72	1.08	.97	1.56			
32RU24 [ ]	2	1 1/2	5.18	3	2 1/4	2 3/4	2.64	1.97	1.34	2.46	1.78	2.65			


**Reducing Union: RU/MM connects metric tubes**

Part Number*	T Tube		Tx Tube		Dimensions — mm										
	O.D.	O.D.	A	Hex Flat	B	Hex Flat	Bx	Hex Flat	C	D	Dx	E	F	Fx	G
4RU3 [ ]MM	4	3	41.6	12.7	11.1	11.1	15.1	14.3	2.2	17.9	17.1	25.8			
6RU3 [ ]MM	6	3	43.2	14.3	11.1	12.7	16.3	14.3	2.2	19.5	17.1	26.9			
6RU4 [ ]MM	6	4	44.0	14.3	12.7	12.7	16.3	15.1	2.3	19.5	17.9	27.8			
8RU4 [ ]MM	8	4	43.6	15.9	12.7	14.3	16.7	15.1	2.3	19.1	17.9	27.6			
8RU6 [ ]MM	8	6	46.1	15.9	14.3	14.3	16.7	16.3	3.8	19.1	19.5	29.7			
10RU6 [ ]MM	10	6	46.2	19.1	14.3	17.5	17.5	16.3	3.8	19.8	19.5	29.9			
10RU8 [ ]MM	10	8	45.7	19.1	15.9	17.5	17.5	16.7	5.8	19.8	19.1	29.7			
12RU6 [ ]MM	12	6	49.7	22.2	14.3	20.6	24.6	16.3	3.8	23.4	19.5	29.4			
12RU8 [ ]MM	12	8	50.4	22.2	15.9	20.6	24.6	16.7	5.8	23.4	19.1	30.5			
12RU10 [ ]MM	12	10	50.9	22.2	19.1	20.6	24.6	17.5	7.9	23.4	19.8	30.9			
14RU8 [ ]MM	14	8	47.2	23.8	15.9	22.2	22.2	16.7	5.8	21.0	19.1	29.8			
14RU10 [ ]MM	14	10	48.3	23.8	19.1	22.2	22.2	17.5	7.9	21.0	19.8	30.9			
14RU12 [ ]MM	14	12	52.3	23.8	22.2	22.2	22.2	24.6	9.9	21.0	23.4	30.9			
16RU10 [ ]MM	16	10	50.9	25.4	19.1	23.8	25.0	17.5	7.9	23.4	19.8	31.8			
16RU12 [ ]MM	16	12	54.8	25.4	22.2	23.8	25.0	24.6	9.9	23.4	23.4	31.8			
18RU12 [ ]MM	18	12	57.5	28.6	22.2	27.0	25.4	24.6	9.9	24.6	23.4	35.6			
18RU16 [ ]MM	18	16	57.4	28.6	25.4	27.0	25.4	25.0	12.7	24.6	23.4	36.3			
22RU12 [ ]MM	22	12	59.5	31.8	22.2	30.1	27.0	24.6	9.9	24.6	23.4	36.3			
22RU18 [ ]MM	22	18	61.1	31.8	28.6	34.9	27.0	25.4	15.8	24.6	24.6	40.0			
25RU12 [ ]MM	25	12	66.0	38.1	22.2	34.9	33.3	24.6	9.9	27.4	23.4	39.6			
25RU18 [ ]MM	25	18	64.0	38.1	28.6	34.9	33.3	25.4	15.8	27.4	24.6	39.6			


**Reducing Union: RU/ME connects metric tubes to fractional tubes**

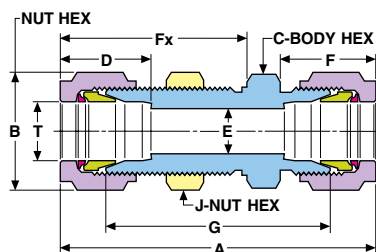
Part Number*	T Tube		Tx Tube		Dimensions — mm										
	O.D.	O.D.	A	Hex Flat	B	Hex Flat	Bx	Hex Flat	C	D	Dx	E	F	Fx	G
3RU1 [ ]ME	3	1/16	36.1	11.1	7.9	11.1	14.3	10.3	1.2	17.1	12.3	22.6			
3RU2 [ ]ME	3	1/8	38.0	11.1	11.1	11.1	14.3	14.3	2.2	17.1	17.1	22.0			
3RU4 [ ]ME	3	1/4	42.5	11.1	14.3	12.5	14.3	16.3	2.5	17.1	19.5	26.0			
4RU2 [ ]ME	4	1/8	40.6	12.7	11.1	11.1	15.1	14.3	2.2	17.9	17.1	24.8			
4RU4 [ ]ME	4	1/4	43.0	12.7	14.3	12.7	15.1	16.3	2.2	17.9	19.5	26.0			
6RU1 [ ]ME	6	1/16	37.5	14.3	7.9	12.7	16.3	10.3	1.2	19.5	12.3	23.5			
6RU2 [ ]ME	6	1/8	43.2	14.3	11.1	12.7	16.3	14.3	2.2	19.5	17.1	26.9			
6RU4 [ ]ME	6	1/4	44.7	14.3	14.3	12.7	16.3	16.3	3.8	19.5	19.5	27.9			
6RU8 [ ]ME	6	1/2	49.7	14.3	22.2	20.6	16.3	24.6	3.8	19.5	23.4	29.4			
8RU2 [ ]ME	8	1/8	42.9	15.9	11.1	14.3	16.7	14.3	2.2	19.1	17.1	26.9			
8RU3 [ ]ME	8	3/16	43.2	15.9	12.7	14.3	16.7	15.1	3.1	19.1	17.9	27.2			
8RU4 [ ]ME	8	1/4	44.8	15.9	14.3	14.3	16.7	16.3	4.6	19.1	19.5	28.5			
8RU6 [ ]ME	8	3/8	42.7	15.9	17.5	15.9	16.7	18.3	5.9	19.5	23.4	29.4			
8RU8 [ ]ME	8	1/2	50.9	15.9	22.2	20.6	16.7	24.6	5.8	19.1	23.4	31.0			
8RU10 [ ]ME	8	5/8	50.1	15.9	25.4	23.8	16.7	25.4	5.8	19.1	23.4	31.0			
10RU2 [ ]ME	10	1/8	43.5	19.1	11.1	17.5	17.5	14.3	2.3	19.8	17.1	27.5			
10RU4 [ ]ME	10	1/4	46.8	19.1	14.3	17.5	17.5	16.3	4.6	19.8	19.5	30.5			
10RU6 [ ]ME	10	3/8	46.8	19.1	17.5	17.5	17.5	18.3	7.4	19.8	21.0	30.0			
10RU8 [ ]ME	10	1/2	50.3	19.1	22.2	20.6	17.5	24.6	7.9	19.8	23.4	30.4			
10RU10 [ ]ME	10	5/8	50.9	19.1	25.4	23.8	17.5	25.4	7.9	19.8	23.4	31.8			
12RU4 [ ]ME	12	1/4	49.5	22.2	14.3	20.6	24.6	16.3	4.8	23.4	19.5	29.5			
12RU6 [ ]ME	12	3/8	50.1	22.2	17.5	20.6	24.6	18.3	7.4	23.4	21.0	29.4			
12RU8 [ ]ME	12	1/2	54.9	22.2	22.2	20.6	24.6	24.6	9.9	23.4	23.4	31.0			
16RU10 [ ]ME	16	5/8	55.0	25.4	25.4	23.8	25.0	25.4	12.7	23.4	23.4	32.5			
16RU12 [ ]ME	16	3/4	57.5	25.4	28.6	27.0	25.0	25.4	12.7	23.4	24.6	35.0			
18RU12 [ ]ME	18	3/4	57.0	28.6	28.6	27.0	25.4	25.4	15.8	24.6	24.6	35.5			

**Bulkhead Union: BU connects fractional tubes**

Part Number*	T Tube O.D.	Dimensions — inches										Panel Hole Size	Max. Panel Thickness
		A	B Hex Flat	C Hex Flat	D	E	F	Fx	G	J Hex Flat			
1BU [ ]	1/16	1.50	5/16	7/16	.41	.05	.48	.91	1	3/8	.20	11/32	
2BU [ ]	1/8	2.13	7/16	1/2	.56	.09	.67	1.19	1.50	1/2	.33	7/16	
3BU [ ]	3/16	2.22	1/2	9/16	.59	.13	.70	1.31	1.59	9/16	.39	15/32	
4BU [ ]	1/4	2.34	9/16	5/8	.64	.19	.77	1.36	1.69	5/8	.45	15/32	
6BU [ ]	3/8	2.56	11/16	3/4	.72	.30	.83	1.50	1.88	3/4	.58	17/32	
8BU [ ]	1/2	2.94	7/8	15/16	.97	.42	.92	1.72	2	15/16	.77	19/32	
10BU [ ]	5/8	2.94	1	1 1/16	1	.50	.92	1.72	2.06	1 1/16	.89	9/16	
12BU [ ]	3/4	3.19	1 1/8	1 3/16	1	.66	.97	1.91	2.31	1 3/16	1.02	21/32	
14BU [ ]	7/8	3.41	1 1/4	1 5/16	1.06	.72	.97	2.09	2.53	1 5/16	1.14	25/32	
16BU [ ]	1	3.95	1 1/2	1 9/16	1.31	.88	1.08	2.34	2.81	1 9/16	1.33	1 1/32	
24BU [ ]	1 1/2	5.48	2 1/4	2 1/4	1.97	1.34	1.78	3.01	3.34	2 1/4	1.95	3/4	
32BU [ ]	2	7.10	3	2 3/4	2.66	1.81	2.47	3.69	4.16	3	2.64	3/4	



Fractional fitting shown


**Bulkhead Union: BU/MM connects metric tubes**

Part Number*	T Tube O.D.	Dimensions — mm										Panel Hole Size	Max. Panel Thickness
		A	B Hex Flat	C Hex Flat	D	E	F	Fx	G	J Hex Flat			
3BU [ ]MM	3	56.3	11.1	12.7	14.3	2.2	17.1	32.5	40.4	12.7	8.3	12.0	
4BU [ ]MM	4	58.1	12.7	14.3	15.1	2.3	17.9	33.2	42.4	14.3	10.0	12.0	
6BU [ ]MM	6	60.8	14.3	15.9	16.3	3.8	19.5	34.6	44.1	15.9	11.5	13.0	
8BU [ ]MM	8	64.0	15.9	17.5	16.7	5.8	19.1	36.6	48.0	17.5	13.1	14.0	
10BU [ ]MM	10	64.2	19.1	19.1	17.5	7.9	19.8	37.3	48.2	19.1	16.5	14.0	
12BU [ ]MM	12	74.7	22.2	23.8	24.6	9.9	23.4	43.7	50.8	23.8	19.5	16.0	
14BU [ ]MM	14	69.6	23.8	25.4	22.2	11.9	21.0	41.1	50.8	23.8	21.0	16.0	
15BU [ ]MM	15	72.5	23.8	25.4	22.2	12.7	21.8	42.1	51.9	23.8	21.0	16.0	
16BU [ ]MM	16	74.7	25.4	27.0	25.0	12.7	23.4	43.7	52.4	27.0	22.5	14.0	
18BU [ ]MM	18	78.7	28.6	30.2	25.4	15.8	24.6	48.0	58.7	30.2	26.0	17.0	
20BU [ ]MM	20	92.0	31.8	33.3	31.0	16.7	27.0	41.8	64.3	33.3	29.0	20.0	
22BU [ ]MM	22	89.0	31.8	33.3	27.0	17.9	24.6	53.0	66.6	33.3	29.5	24.0	
25BU [ ]MM	25	100.7	38.1	39.7	33.3	21.7	27.4	60.0	71.9	39.7	33.8	24.0	

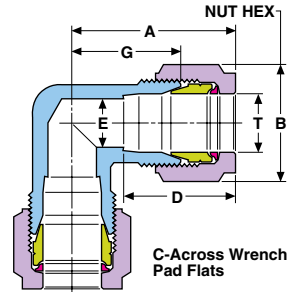
\* [ ] see page 6 for material specifications.

**GYROLOK® Tube Fittings**  
**Union Elbow: LU connects fractional tubes**



Metric fitting shown

Part Number*	T Tube O.D.	Dimensions – inches					
		A	Hex Flat	C	D	E	G
1LU [ ]	1/16	.78	5/16	7/16	.41	.05	.56
2LU [ ]	1/8	.97	7/16	7/16	.56	.09	.66
3LU [ ]	3/16	1	1/2	7/16	.59	.13	.69
4LU [ ]	1/4	1.05	9/16	7/16	.64	.19	.72
6LU [ ]	3/8	1.19	11/16	1/2	.72	.30	.84
8LU [ ]	1/2	1.44	7/8	11/16	.97	.42	.97
10LU [ ]	5/8	1.47	1	13/16	1	.50	.03
12LU [ ]	3/4	1.59	1 1/8	1	1	.66	.16
14LU [ ]	7/8	1.72	1 1/4	1 1/4	1.06	.72	.28
16LU [ ]	1	1.88	1 1/2	1 1/4	1.31	.88	.31
20LU [ ]	1 1/4	2.67	1 7/8	1 11/16	1.62	1.09	1.75
24LU [ ]	1 1/2	3.07	2 1/4	2	1.97	1.34	2
32LU32 [ ]	2	4.22	3	2 3/4	2.66	1.81	2.75



**Union Elbow: LU/MM connects metric tubes**

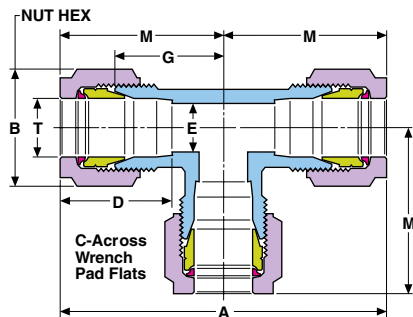
Part Number*	T Tube O.D.	Dimensions – mm					
		A	Hex Flat	C	D	E	G
3LUJ [MM]	3	24.6	11.1	11.0	14.3	2.2	16.7
4LUJ [MM]	4	25.3	12.7	11.0	15.1	2.3	17.5
6LUJ [MM]	6	26.6	14.3	11.0	16.3	3.8	18.3
8LUJ [MM]	8	28.6	15.9	12.6	16.7	5.8	20.6
10LUJ [MM]	10	32.6	19.1	17.3	17.5	7.9	24.6
12LUJ [MM]	12	36.6	22.2	17.3	24.6	9.9	24.6
14LUJ [MM]	14	34.0	23.8	17.3	22.2	11.9	24.6
15LUJ [MM]	15	36.5	23.8	17.4	22.2	12.7	26.2
16LUJ [MM]	16	37.3	25.4	20.5	25.0	12.7	26.2
18LUJ [MM]	18	39.3	28.6	25.3	25.4	15.8	29.4
20LUJ [MM]	20	46.4	31.8	31.8	31.0	16.7	32.5
22LUJ [MM]	22	43.7	31.8	31.6	27.0	17.9	32.5
25LUJ [MM]	25	47.8	38.1	31.6	33.3	21.8	33.3
30LUJ [MM]	30	69.9	50.8	46	39.2	26.2	48.3
32LUJ [MM]	32	72.3	50.8	46	41.6	28.6	49.3
38LUJ [MM]	38	84	60.3	55	47.9	33.7	56.4



Metric fitting shown

**Union Tee: TTT connects fractional tubes**

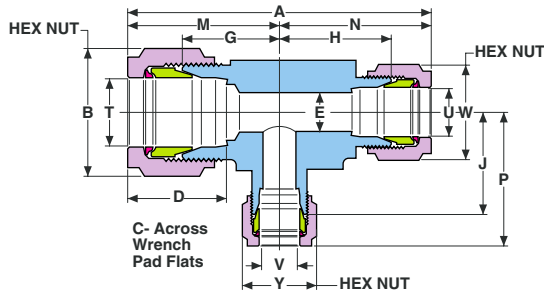
Part Number*	T Tube O.D.	Dimensions – inches						
		A	Hex Flat	C	D	E	G	M
1TTT [ ]	1/16	1.56	5/16	7/16	.41	.05	.56	.78
2TTT [ ]	1/8	1.94	7/16	7/16	.56	.09	.66	.97
3TTT [ ]	3/16	2	1/2	7/16	.59	.13	.69	1
4TTT [ ]	1/4	2.04	9/16	7/16	.64	.19	.72	1.05
6TTT [ ]	3/8	2.38	11/16	1/2	.72	.30	.84	1.19
8TTT [ ]	1/2	2.88	7/8	11/16	.97	.42	.97	1.44
10TTT [ ]	5/8	2.94	1	13/16	1	.50	1.03	1.47
12TTT [ ]	3/4	3.19	1 1/8	1	1	.66	1.16	1.59
14TTT [ ]	7/8	3.44	1 1/4	1 1/4	1.06	.72	1.28	1.72
16TTT [ ]	1	3.75	1 1/2	1 1/4	1.31	.88	1.31	1.88
20TTT [ ]	1 1/4	5.24	1 7/8	1 11/16	1.53	1.09	1.75	2.62
24TTT [ ]	1 1/2	6.14	2 1/4	2	1.78	1.34	2	3.07
32TTT [ ]	2	8.44	3	2 3/4	2.50	1.81	2.75	4.22



**Union Tee: TTT/MM connects metric tubes**

Part Number*	T Tube O.D.	Dimensions – mm						
		A	Hex Flat	C	D	E	G	M
3TTT [MM]	3	49.4	11.1	11.1	14.3	2.2	16.8	24.7
4TTT [MM]	4	50.7	12.7	11.1	15.1	2.2	17.5	25.4
6TTT [MM]	6	53.3	14.3	11.1	16.3	3.8	18.3	26.7
8TTT [MM]	8	57.2	15.9	12.7	16.7	5.8	20.6	28.6
10TTT [MM]	10	65.2	19.1	17.5	17.5	7.9	24.6	32.6
12TTT [MM]	12	73.2	22.2	17.5	24.6	9.9	24.6	36.6
14TTT [MM]	14	71.1	23.8	20.7	22.2	11.9	26.2	35.6
15TTT [MM]	15	72.9	23.8	20.7	22.2	12.7	26.2	36.5
16TTT [MM]	16	74.6	25.4	20.7	25.0	12.7	26.2	37.3
18TTT [MM]	18	78.9	28.6	25.4	25.4	15.8	29.5	39.4
20TTT [MM]	20	92.7	31.8	31.8	31.0	16.7	32.5	46.4
22TTT [MM]	22	87.4	31.8	31.8	27.0	17.9	32.5	43.7
25TTT [MM]	25	95.4	38.1	31.8	33.3	21.7	33.3	47.7
30TTT [MM]	30	139.7	50.8	46	39.2	26.2	48.3	69.9
32TTT [MM]	32	144.6	50.8	46	41.6	28.6	49.3	72.3
38TTT [MM]	38	168	60.3	55	47.9	33.7	56.4	84

\* [ ] see page 6 for material specifications.



### Reducing Run Tee: TTT\_B

connects fractional tubes

Part Number*	Dimensions — inches															
	T Tube O.D.	U Run	V Branch	B Hex Flat		C	D	E	G	H	J	M	N	P	W Hex Flat	Y Hex Flat
10TTT 8BR6 [ ]	5/8	1/2	3/8	2.94	1	.81	1.11	.42	1.03	1	1.02	1.47	1.47	1.36	7/8	11/16
12TTT 10BR6 [ ]	3/4	5/8	3/8	3.16	1 1/8	1	1.09	.50	1.16	1.12	1.11	1.60	1.56	1.45	1 1/8	11/16
12TTT 10BR8 [ ]	3/4	5/8	1/2	3.16	1 1/8	1	1.09	.50	1.16	1.12	1.09	1.60	1.56	1.56	1 1/8	7/8
16TTT 10BR6 [ ]	1	5/8	3/8	3.60	1 1/2	1.25	1.40	.50	1.31	1.29	1.28	1.87	1.73	1.62	1 1/8	11/16
16TTT 10BR8 [ ]	1	5/8	1/2	3.60	1 1/2	1.25	1.40	.50	1.31	1.29	1.26	1.87	1.73	1.73	1 1/8	7/8
16TTT 12BR6 [ ]	1	3/4	3/8	3.62	1 1/2	1.25	1.40	.66	1.31	1.31	1.28	1.87	1.75	1.62	11/16	11/16



Fractional fitting shown

### Reducing Branch Tee: TTTB

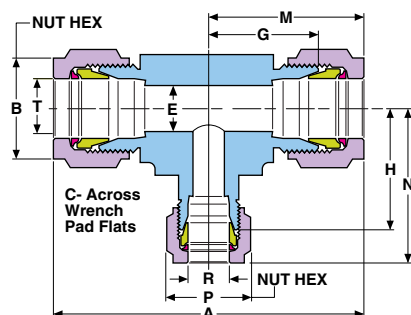
connects fractional tubes

Part Number*	Dimensions — inches											
	T Tube O.D.	R Branch	B Hex Flat		C	E	G	H	M	N	P Hex Flat	
6TTTB6 [ ]	3/8	1/2	2.57	11/16	.68	.30	.94	.97	1.44	1.44	7/8	
8TTTB6 [ ]	1/2	3/8	2.88	7/8	.68	.42	.97	.99	1.33	1.33	11/16	
10TTTB6 [ ]	5/8	3/8	2.94	1	.81	.50	1.03	1.02	1.36	1.36	11/16	
10TTTB8 [ ]	5/8	1/2	2.94	1	.81	.50	1.03	1	1.47	1.47	7/8	
12TTTB6 [ ]	3/4	3/8	3.20	1 1/8	1	.66	1.16	1.11	1.45	1.45	11/16	
12TTTB8 [ ]	3/4	1/2	3.20	1 1/8	1	.66	1.16	1.09	1.56	1.56	7/8	
16TTTB6 [ ]	1	3/8	3.75	1 1/2	1.25	.88	1.31	1.28	1.62	1.62	11/16	
16TTTB8 [ ]	1	1/2	3.75	1 1/2	1.25	.88	1.31	1.26	1.73	1.73	7/8	
20TTTB16 [ ]	1 1/4	1	5.27	1 7/8	1.68	1.11	1.75	1.69	2.65	2.29	1 1/2	
24TTTB16 [ ]	1 1/2	1	6.17	2 1/4	1.68	1.33	2	1.88	3.08	2.48	1 1/2	
32TTTB16 [ ]	2	1	8.41	3	2.75	1.80	2.75	2.31	4.21	2.90	1 1/2	
32TTTB24 [ ]	2	1 1/2	8.41	3	2.75	1.80	2.75	2.75	4.21	3.85	2 1/4	

### Reducing Union Tee: TTTB/MM

connects metric tubes

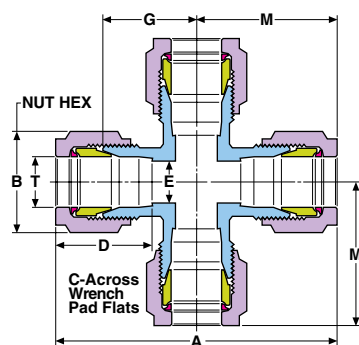
Part Number*	Dimensions — mm											
	T Tube O.D.	R Branch	B Hex Flat		C	E	G	H	M	N	P Hex Flat	
32TTTB25316MM	32	25	144.6	50.8	46	28.6	49.3	49.1	72.3	44.9	38	



\* [ ] see page 6 for material specifications.

**Union Cross: C** connects fractional tubes


Fractional fitting shown

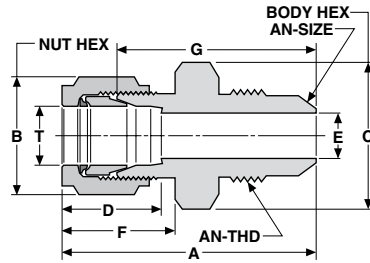


Part Number*	T Tube O.D.	Dimensions – inches						
		A	Hex Flat	C	D	E	G	M
1C [ ]	1/16	1.56	5/16	7/16	.41	.05	.56	.78
2C [ ]	1/8	1.94	7/16	7/16	.56	.09	.66	.97
3C [ ]	3/16	2	1/2	7/16	.59	.13	.69	1
4C [ ]	1/4	2.14	9/16	7/16	.64	.19	.72	1.08
6C [ ]	3/8	2.38	11/16	1/2	.72	.30	.84	1.19
8C [ ]	1/2	2.88	7/8	11/16	.97	.42	.97	1.44
10C [ ]	5/8	2.94	1	1 1/16	1	.50	1.03	1.47
12C [ ]	3/4	3.19	1 1/8	1 3/16	1	.66	1.16	1.59
14C [ ]	7/8	3.44	1 1/4	1 7/16	1.06	.72	1.28	1.72
16C [ ]	1	3.75	1 1/2	1 7/16	1.31	.88	1.31	1.88

**Union Cross: C/MM** connects metric tubes

Part Number*	T Tube O.D.	Dimensions – mm						
		A	Hex Flat	C	D	E	G	M
3C [ ]MM	3	49.2	11.1	11.1	14.3	2.2	16.7	24.6
4C [ ]MM	4	50.5	12.7	11.1	15.1	2.3	17.5	25.3
6C [ ]MM	6	53.2	14.3	11.1	16.3	3.8	18.2	26.6
8C [ ]MM	8	57.2	15.9	12.7	16.7	5.8	20.6	28.6
10C [ ]MM	10	65.1	19.1	17.5	17.5	7.9	24.6	32.6
12C [ ]MM	12	73.1	22.2	17.5	24.6	9.9	24.6	36.5
14C [ ]MM	14	69.6	23.8	20.7	22.2	11.0	25.4	34.8
15C [ ]MM	15	77.8	23.8	20.7	22.2	12.7	26.2	38.9
16C [ ]MM	16	74.8	25.4	20.7	25.0	12.7	26.2	37.4
18C [ ]MM	18	78.6	29.6	25.4	25.4	15.8	29.4	39.3
20C [ ]MM	20	92.7	31.8	31.8	31.0	16.7	32.5	46.4
22C [ ]MM	22	88.0	31.8	31.8	27.0	17.9	32.5	43.7
25C [ ]MM	25	95.0	38.1	31.8	33.3	21.7	33.3	43.7

## AN Fittings

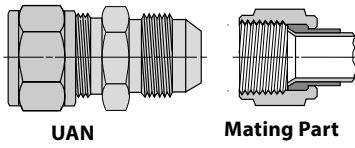


### Union, AN: UAN

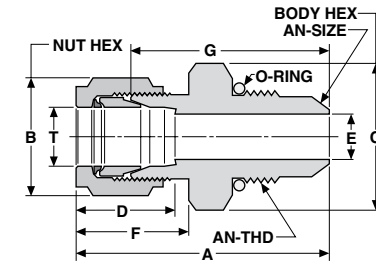
connects **fractional** tube to flared tube

#### UAN Application:

HOKE GYROLOK® with AND 10056 or MS 33656, 37° flare connections for use with flared tubing.

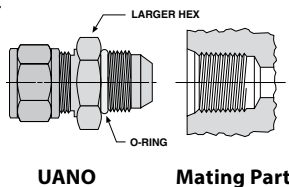


Part Number*	Dimensions — inches									
	T Tube O.D.	AN Size	AN Thread	A	B Hex Flat	C Hex Flat	D	E	F	G
1UAN4 [ ]	1/16	1/4	7/16-20	1.22	5/16	1/2	.41	.05	.48	1
2UAN2 [ ]	1/8	1/8	5/16-24	1.19	7/16	7/16	.56	.06	.67	.97
2UAN4 [ ]	1/8	1/4	7/16-20	1.44	7/16	1/2	.56	.09	.67	1.13
3UAN3 [ ]	3/16	3/16	3/8-24	1.38	1/2	7/16	.59	.13	.70	1.06
4UAN4 [ ]	1/4	1/4	7/16-20	1.52	9/16	1/2	.64	.17	.77	1.19
6UAN4 [ ]	3/8	1/4	7/16-20	1.61	11/16	5/8	.72	.17	.83	1.27
6UAN6 [ ]	3/8	3/8	9/16-18	1.63	11/16	5/8	.72	.30	.83	1.28
8UAN8 [ ]	1/2	1/2	3/4-16	1.88	7/8	13/16	.97	.39	.92	1.41
10UAN10 [ ]	5/8	5/8	7/8-14	1.97	1	15/16	1	.48	.92	1.53
12UAN12 [ ]	3/4	3/4	1 1/16-12	2.16	1 1/8	1 1/8	1	.61	.97	1.72
16UAN16 [ ]	1	1	1 5/16-12	2.50	1 1/2	1 3/8	1.31	.84	1.08	1.94



#### UANO Application:

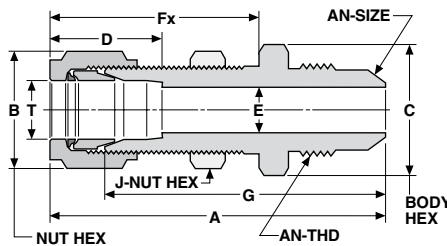
HOKE GYROLOK® with AND 10056 or MS 33656 for gasket sealing with AND 10050 or MS 16142 ports.



### Union, AN O-ring: UANO

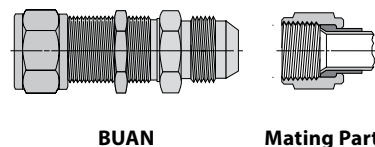
connects **fractional** tube to flared tube

Part Number*	Dimensions — inches									
	T Tube O.D.	AN Size	AN Thread	A	B	C	D	E	F	G
2UAN02 [ ]	1/8	1/8	5/16-24 UNF-3A	1.28	7/16	9/16	.56	.06	.67	.97
2UAN04 [ ]	1/8	1/4	7/16-20 UNF-3A	1.44	7/16	11/16	.56	.09	.67	1.13
4UAN04 [ ]	1/4	1/4	7/16-20 UNF-3A	1.52	9/16	11/16	.64	.17	.77	1.19
4UAN06 [ ]	1/4	3/8	9/16-18 UNF-3A	1.58	9/16	13/16	.64	.19	.77	1.25
6UAN04 [ ]	3/8	1/4	7/16-20 UNF-3A	1.61	11/16	11/16	.72	.17	.83	1.27
6UAN06 [ ]	3/8	3/8	9/16-18 UNF-3A	1.63	11/16	13/16	.72	.30	.83	1.28
8UAN08 [ ]	1/2	1/2	3/4-16 UNF-3A	1.88	7/8	1	.97	.39	.92	1.41



#### BUAN Application:

HOKE GYROLOK® bulkhead configuration and AND 10056 or MS 33656, 37° flare connection for use with flared tubing.

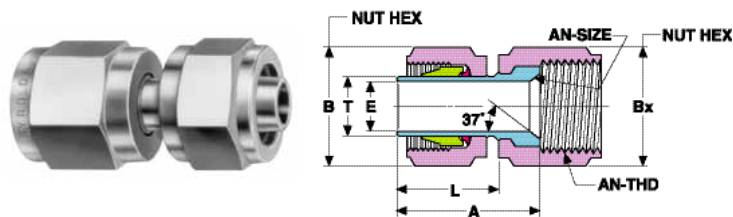


### Bulkhead Union, AN: BUAN

connects **fractional** tube to flared tube

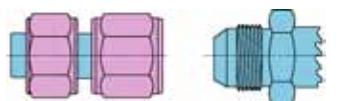
Part Number*	Dimensions — inches										Panel Hole	Max. Panel Thick.	
	T Tube O.D.	AN Size	AN Thread	A	B	C	D	E	Fx	G			J
2BUAN2 [ ]	1/8	1/8	5/16-24	1.92	7/16	1/2	.56	.06	1.28	1.61	1/2	21/64	7/16
2BUAN4 [ ]	1/8	1/4	7/16-20	2.08	7/16	1/2	.56	.09	1.28	1.77	1/2	21/64	7/16
3BUAN3 [ ]	3/16	3/16	3/8-24	2.09	1/2	9/16	.59	.13	1.31	1.78	9/16	25/64	15/32
4BUAN4 [ ]	1/4	1/4	7/16-20	2.16	9/16	5/8	.64	.17	1.36	1.83	5/8	29/64	15/32
6BUAN4 [ ]	3/8	1/4	7/16-20	2.31	11/16	3/4	.72	.17	1.50	1.97	3/4	37/64	17/32
6BUAN6 [ ]	3/8	3/8	9/16-18	2.31	11/16	3/4	.72	.30	1.50	1.97	3/4	37/64	17/32
8BUAN8 [ ]	1/2	1/2	3/4-16	2.66	7/8	15/16	.97	.39	1.72	2.19	15/16	49/64	19/32
10BUAN10 [ ]	5/8	5/8	7/8-14	2.80	1	1 1/16	1	.48	1.72	2.36	1 1/16	57/64	9/16
12BUAN12 [ ]	3/4	3/4	1 1/16-12	3.34	1 1/8	1 3/16	1	.61	1.91	2.70	1 3/16	1 21/64	21/32
16BUAN16 [ ]	1	1	1 5/16-12	3.72	1 1/2	1 9/16	1.31	.84	2.34	3.16	1 9/16	1 21/64	1 1/32

\* [ ] see page 6 for material specifications.



### AAN Application:

HOKE GYROLOK® tube stub with ferrules pre-set with 37° flare connection for use with AND 10056 or MS 33656 ends.



AAN

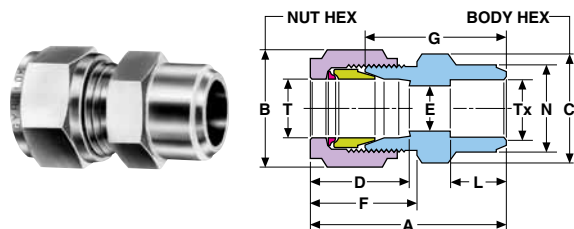
Mating Part

**Note:** The tube stub end comes with pre-set HOKE GYROLOK® ferrules. To assemble, follow HOKE GYROLOK® remake instructions, page 53.

### Adapter, AN: AAN

connects fractional GYROLOK® port to flared tube

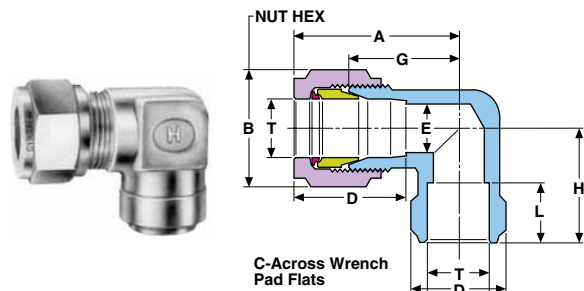
Part Number*	T		AN		Dimensions — inches			
	Tube O.D.	AN Size	AN Thread	A	B Hex Flat	Bx Hex Flat	E	L
2AAN2 [ ]	1/8	1/8	5/16-24	.92	7/16	3/8	.09	.61
2AAN4 [ ]	1/8	1/4	7/16-20	.91	7/16	9/16	.09	.61
3AAN3 [ ]	3/16	3/16	3/8-24	1	1/2	7/16	.13	.67
4AAN4 [ ]	1/4	1/4	7/16-20	1	9/16	9/16	.19	.70
6AAN6 [ ]	3/8	3/8	9/16-18	1.17	11/16	11/16	.28	.78
8AAN8 [ ]	1/2	1/2	3/4-16	1.44	7/8	7/8	.39	.98
10AAN10 [ ]	5/8	5/8	7/8-14	1.53	1	1	.50	1.09
12AAN12 [ ]	3/4	3/4	1 1/16-12	1.59	1 1/8	1 1/4	.59	1.14
16AAN16 [ ]	1	1	1 5/16-12	1.84	1 1/2	1 1/2	.80	1.31



### Tube Socket Weld Connector: CW

connects fractional tubes

Part Number*	T		Tx		Dimensions — inches							
	Tube O.D.	Tube O.D.	A	B Hex Flat	C Hex Flat	D	E	F	G	L	N	
2CW2 [ ]	1/8	1/8	1.19	7/16	7/16	.56	.09	.67	.88	.25	.31	
3CW3 [ ]	3/16	3/16	1.27	1/2	7/16	.59	.13	.70	.95	.28	.38	
4CW4 [ ]	1/4	1/4	1.36	9/16	1/2	.64	.19	.77	1.03	.31	.44	
4CW6 [ ]	1/4	3/8	1.42	9/16	5/8	.64	.19	.77	1.09	.47	.61	
6CW6 [ ]	3/8	3/8	1.53	11/16	5/8	.72	.30	.83	1.19	.38	.63	
8CW6 [ ]	1/2	3/8	1.69	7/8	13/16	.97	.30	.92	1.22	.47	.61	
8CW8 [ ]	1/2	1/2	1.69	7/8	13/16	.97	.42	.92	1.22	.50	.75	
10CW10 [ ]	5/8	5/8	1.69	1	15/16	1	.50	.92	1.25	.56	.88	
12CW12 [ ]	3/4	3/4	1.75	1 1/8	1 1/16	1	.66	.97	1.31	.56	1.06	
16CW16 [ ]	1	1	2.16	1 1/2	1 3/8	1.31	.88	1.08	1.59	.75	1.31	



### Tube Socket Weld Elbow: LW

connects fractional tubes

Part Number*	T		Dimensions — inches							
	Tube O.D.	A Hex Flat	B Hex Flat	C	D	E	G	H	L	N
2LW2 [ ]	1/8	.97	7/16	7/16	.56	.09	.66	.66	.25	.48
3LW3 [ ]	3/16	1	1/2	7/16	.59	.13	.69	.69	.28	.48
4LW4 [ ]	1/4	1.05	9/16	7/16	.64	.19	.72	.72	.31	.48
6LW6 [ ]	3/8	1.19	11/16	1/2	.72	.30	.84	.84	.38	.61
8LW8 [ ]	1/2	1.44	7/8	11/16	.97	.42	.97	.97	.50	.83
10LW10 [ ]	5/8	1.47	1	13/16	1	.50	1.03	1.03	.56	.95
12LW12 [ ]	3/4	1.59	1 1/8	1	1	.66	1.16	1.16	.56	1.13
16LW16 [ ]	1	1.88	1 1/2	1 1/4	1.31	.88	1.31	1.31	.75	1.38

\* [ ] see page 6 for material specifications.

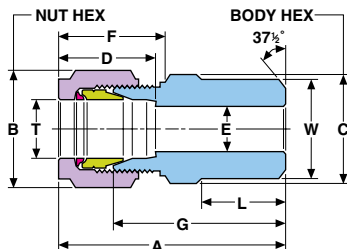


## Butt Weld Connector: CBW

connects fractional tube to pipe



Metric fitting shown



Part Number*	T Tube O.D.	W Butt Weld O.D.	Nom. Pipe Size	Dimensions — inches							
				A	B Hex Flat	C Hex Flat	D	E	F	G	L
2CBW2 [ ]	1/8	.41	1/8	1.22	7/16	7/16	.56	.22	.67	.91	.38
3CBW2 [ ]	3/16	.41	1/8	1.27	1/2	7/16	.59	.22	.70	.95	.38
4CBW2 [ ]	1/4	.41	1/8	1.33	9/16	1/2	.64	.22	.77	1	.38
4CBW4 [ ]	1/4	.54	1/4	1.52	9/16	9/16	.64	.30	.77	1.19	.56
6CBW4 [ ]	3/8	.54	1/4	1.63	11/16	5/8	.72	.30	.83	1.28	.56
6CBW6 [ ]	3/8	.68	3/8	1.63	11/16	11/16	.72	.42	.83	1.28	.56
6CBW8 [ ]	3/8	.84	1/2	1.84	11/16	7/8	.72	.55	.83	1.50	.75
8CBW4 [ ]	1/2	.54	1/4	1.69	7/8	13/16	.97	.30	.92	1.22	.56
8CBW6 [ ]	1/2	.68	3/8	1.78	7/8	13/16	.97	.42	.92	1.31	.56
8CBW8 [ ]	1/2	.84	1/2	1.97	7/8	7/8	.97	.55	.92	1.50	.75
10CBW8 [ ]	5/8	.84	1/2	1.97	1	15/16	1	.55	.97	1.53	.75
12CBW12 [ ]	3/4	1.05	3/4	2.03	1 1/8	1 1/16	1	.78	.97	1.59	.75
16CBW16 [ ]	1	1.32	1	2.53	1 1/2	1 3/8	1.31	1	1.08	1.97	.94
20CBW20 [ ]	1 1/4	1.66	2	3.04	2	1 3/4	1.62	1.09	1.53	2.17	.94
24CBW24 [ ]	1 1/2	1.90	2 1/4	3.50	2 1/4	2 1/8	1.97	1.34	1.78	2.43	1.03
32CBW32 [ ]	2	2.38	3	4.47	3	2 3/4	2.66	1.88	2.47	3	1.06

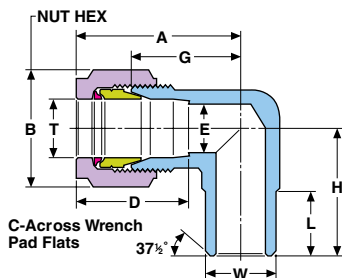
## Butt Weld Connector: CBW/ME

connects metric tube to pipe

Part Number*	T Tube O.D.	W Butt Weld O.D.	Nom. Pipe Size	Dimensions — mm							
				A	B Hex Flat	C Hex Flat	D	E	F	G	L
3CBW2 [ ]ME	3	10.3	1/8	31.0	11.1	11.1	14.3	2.2	17.1	23.0	9.5
4CBW2 [ ]ME	4	10.3	1/8	34.1	12.7	11.1	15.1	2.4	17.9	26.3	9.5
6CBW2 [ ]ME	6	10.3	1/8	35.0	14.3	12.7	16.3	3.8	19.5	26.7	9.5
6CBW4 [ ]ME	6	13.7	1/4	39.9	14.3	14.3	16.3	3.8	19.5	31.5	14.3
8CBW2 [ ]ME	8	10.3	1/8	34.5	15.9	14.3	16.7	3.8	19.1	26.5	9.5
8CBW4 [ ]ME	8	13.7	1/4	39.4	15.9	14.3	16.7	5.8	19.1	31.4	14.3
8CBW6 [ ]ME	8	17.2	3/8	39.4	15.9	17.5	16.7	5.8	19.1	31.4	14.2
8CBW8 [ ]ME	8	21.5	1/2	45.0	15.9	22.2	16.7	5.8	19.1	37.0	19.1
10CBW4 [ ]ME	10	13.7	1/4	40.5	19.1	17.5	17.5	7.7	19.8	32.5	14.3
10CBW6 [ ]ME	10	17.2	3/8	41.5	19.1	17.5	17.5	7.9	19.8	33.5	14.2
10CBW8 [ ]ME	10	21.3	1/2	46.1	19.1	22.2	17.5	7.9	19.8	38.1	19.1
12CBW4 [ ]ME	12	13.7	1/4	43.7	22.2	20.6	24.6	7.7	23.4	31.8	14.3
12CBW6 [ ]ME	12	17.2	3/8	44.0	22.2	22.2	24.6	7.9	23.4	32.0	14.2
12CBW8 [ ]ME	12	21.3	1/2	50.0	22.2	22.2	24.6	9.9	23.4	38.1	19.1
12CBW12 [ ]ME	12	26.7	3/4	51.8	22.2	27.0	24.6	9.9	23.4	39.9	19.1
14CBW8 [ ]ME	14	21.3	1/2	47.5	23.8	22.2	22.2	11.9	21.0	38.1	19.1
16CBW8 [ ]ME	16	21.3	1/2	50.0	25.4	23.8	25.0	12.7	23.4	38.9	19.1
18CBW8 [ ]ME	18	21.3	1/2	51.2	28.6	27.0	25.4	13.8	24.6	41.3	19.1
22CBW16 [ ]ME	22	33.4	1	57.4	31.8	34.9	27.0	17.9	24.6	46.2	23.8
25CBW16 [ ]ME	25	33.4	1	64.0	38.1	34.9	33.3	21.7	27.4	50.0	23.8



Metric fitting shown



## Butt Weld Elbow: LBW

connects fractional tube to pipe

Part Number*	T Tube O.D.	W Butt Weld O.D.	Nom. Pipe Size	Dimensions — inches							
				A	B Hex Flat	C	D	E	G	H	L
2LBW2 [ ]	1/8	.41	1/8	.97	7/16	7/16	.56	.09	.66	.72	.41
3LBW2 [ ]	3/16	.41	1/8	1	1/2	7/16	.59	.13	.69	.75	.45
4LBW2 [ ]	1/4	.41	1/8	1.05	9/16	7/16	.64	.19	.72	.78	.48
4LBW4 [ ]	1/4	.54	1/4	1.11	9/16	1/2	.64	.19	.78	.94	—
6LBW4 [ ]	3/8	.54	1/4	1.19	11/16	1/2	.72	.30	.84	1	—
8LBW6 [ ]	1/2	.68	3/8	1.44	7/8	11/16	.97	.42	.97	1.13	—
8LBW8 [ ]	1/2	.84	1/2	1.50	7/8	13/16	.97	.42	1.03	1.31	—
10LBW8 [ ]	5/8	.84	1/2	1.47	1	13/16	1	.50	1.03	1.38	—
12LBW12 [ ]	3/4	1.05	3/4	1.59	1 1/8	13/16	1	.66	1.16	1.50	—
16LBW12 [ ]	1	1.05	3/4	1.88	1 1/2	1 1/4	1.31	.88	1.31	1.66	.86
16LBW16 [ ]	1	1.32	1	1.88	1 1/2	1 1/4	1.31	.88	1.31	1.84	—

## Butt Weld Elbow: LBW/ME

connects metric to pipe

Part Number*	T Tube O.D.	W Butt Weld O.D.	Nom. Pipe Size	Dimensions — mm							
				A	B Hex Flat	C	D	E	G	H	L
3LBW2 [ ]ME	3	10.3	1/8	25.0	11.1	11.0	14.3	2.2	17.0	19.0	9.5
6LBW2 [ ]ME	6	10.3	1/8	26.5	14.3	11.0	16.3	3.8	18.5	20.0	9.5
6LBW4 [ ]ME	6	13.7	1/4	28.0	14.3	12.5	16.3	3.8	18.5	25.5	14.3
12LBW12 [ ]ME	12	26.7	3/4	38.1	22.2	25.4	24.6	9.9	26.2	38.1	19.1
16LBW8 [ ]ME	16	21.3	1/2	37.5	25.4	21.5	25.0	12.7	26.0	33.5	19.1
18LBW8 [ ]ME	18	21.3	1/2	39.4	28.6	25.4	25.4	13.9	29.5	38.1	19.1

\* [ ] see page 6 for material specifications.

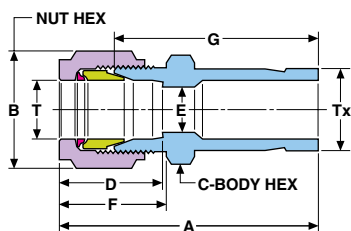


Reducer: R connects fractional tube to fractional port

Table with columns: Part Number, T Tube O.D., Tx Tube O.D., Dimensions - inches (A, B Hex Flat, C Hex Flat, D, E, F, G). Lists 48 different reducer part numbers and their dimensions.



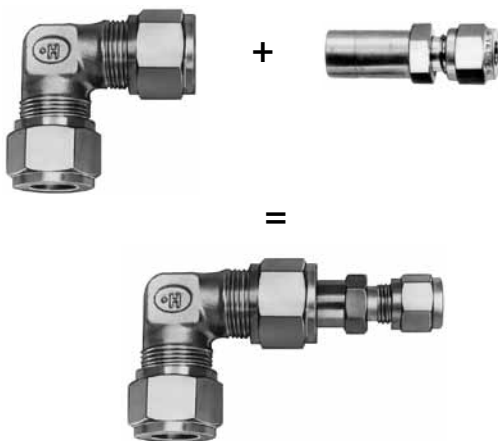
Fractional fitting shown



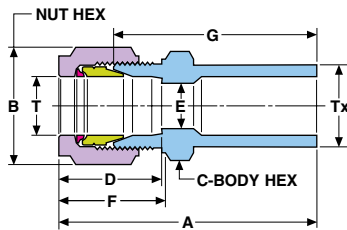
Reducer: R/MM connects metric tube to metric port

Table with columns: Part Number, T Tube O.D., Tx Tube O.D., Dimensions - mm (A, B Hex Flat, C Hex Flat, D, E, F, G). Lists 48 different reducer part numbers and their dimensions in millimeters.

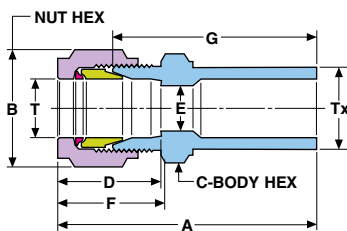
Reducing Assemblies Made With HOKE GYROLOK® Fittings
Use the HOKE GYROLOK® Reducer to reduce the size of an existing fitting, there by providing more flexibility in a variety of installations. It comes with a HOKE GYROLOK® fitting on one end and a machined tube stub on the other.



\* [] see page 6 for material specifications.


**Reducer: R/ME connects metric tube to fractional port**

Part Number*	T Tube O.D.	Tx Tube O.D.	Dimensions – mm						
			A	B Hex Flat	C Hex Flat	D	E	F	G
3R2[ ]ME	3	1/8	39.0	11.1	11.1	14.3	2.2	17.1	30.0
3R4[ ]ME	3	1/4	40.0	11.1	11.1	14.3	2.2	17.1	31.0
3R6[ ]ME	3	3/8	43.0	11.1	12.7	14.3	2.2	17.1	34.0
4R4[ ]ME	4	1/4	41.4	12.7	11.1	15.1	2.3	17.9	33.5
6R2[ ]ME	6	1/8	41.1	14.3	12.7	16.3	3.8	19.5	32.8
6R4[ ]ME	6	1/4	42.6	14.3	12.7	16.3	3.8	19.5	34.2
6R6[ ]ME	6	3/8	44.9	14.3	12.7	16.3	3.8	19.5	36.6
6R8[ ]ME	6	1/2	49.8	14.3	14.3	16.3	3.8	19.5	41.4
6R10[ ]ME	6	5/8	52.0	14.3	17.5	16.3	4.6	19.5	43.6
8R6[ ]ME	8	3/8	45.1	15.9	14.3	16.7	5.9	19.1	37.1
8R8[ ]ME	8	1/2	49.2	15.9	14.3	16.7	5.8	19.1	41.2
8R10[ ]ME	8	5/8	53.5	15.9	17.5	16.7	5.8	19.1	45.5
10R6[ ]ME	10	3/8	45.7	19.1	17.5	17.5	7.0	19.8	37.7
10R8[ ]ME	10	1/2	50.6	19.1	17.5	17.5	7.9	19.8	42.6
10R10[ ]ME	10	5/8	53.8	19.1	17.5	17.5	7.9	19.8	45.8
12R8[ ]ME	12	1/2	56.4	22.2	20.6	24.6	9.9	23.4	44.5
12R12[ ]ME	12	3/4	61.5	22.2	20.6	24.6	9.9	23.4	49.5
18R12[ ]ME	18	3/4	61.0	28.6	27.0	25.4	15.0	24.6	51.1
25R16[ ]ME	25	1	64.0	38.1	27.0	33.3	13.8	27.4	54.0


**Reducer: R/EM connects fractional tube to metric port**

Part Number*	T Tube O.D.	Tx Tube O.D.	Dimensions – mm						
			A	B Hex Flat	C Hex Flat	D	E	F	G
1R3[ ]EM	1/16	3	33.5	7.9	7.9	10.3	1.2	12.3	27.9
1R8[ ]EM	1/16	8	37.3	7.9	11.1	10.3	1.2	12.3	31.8
2R6[ ]EM	1/8	6	38.9	11.1	11.1	14.3	4.5	17.1	30.9
4R3[ ]EM	1/4	3	42.1	14.3	12.7	16.3	2.1	19.5	33.8
4R8[ ]EM	1/4	8	45.2	14.3	12.7	16.3	4.6	19.5	36.8
4R10[ ]EM	1/4	10	46.1	14.3	12.7	16.3	4.6	19.5	37.7
4R12[ ]EM	1/4	12	50.7	14.3	14.3	16.3	4.6	19.5	42.4
4R18[ ]EM	1/4	18	54.1	14.3	20.6	16.3	4.6	19.5	45.7



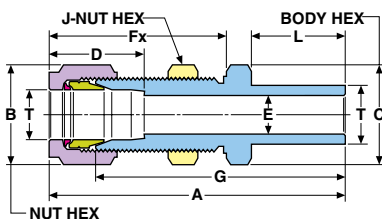
Metric fitting shown

**Bulkhead Adapter: BA connects fractional tube to fractional port**

Part Number*	T Tube O.D.	Dimensions – inches										Panel Hole Size	Max. Panel Thick.
		A	B Hex Flat	C Hex Flat	D	E	Fx	G	J Hex Flat	L			
2BA2 [ ]	1/8	2.09	7/16	1/2	.56	.09	1.28	1.72	1/2	.63	.33	7/16	
3BA3 [ ]	3/16	2.16	1/2	9/16	.59	.13	1.31	1.84	9/16	.66	.39	15/32	
4BA4 [ ]	1/4	2.27	9/16	5/8	.64	.19	1.36	1.94	5/8	.69	.45	15/32	
6BA6 [ ]	3/8	2.50	11/16	3/4	.72	.28	1.50	2.16	3/4	.78	.58	17/32	
8BA8 [ ]	1/2	2.94	7/8	15/16	.97	.39	1.72	2.47	15/16	.97	.77	17/32	
10BA10 [ ]	5/8	3.09	1	1 1/16	1	.50	1.72	2.66	1 1/16	1.08	.89	9/16	
12BA12 [ ]	3/4	3.38	1 1/8	1 3/16	1	.59	1.91	2.94	1 3/16	1.13	1.02	21/32	
14BA14 [ ]	7/8	3.63	1 1/4	1 5/16	1.06	.69	2.09	3.19	1 5/16	1.19	1.14	25/32	
16BA16 [ ]	1	4.14	1 1/2	1 9/16	1.08	.80	2.34	3.58	1 9/16	1.38	1.33	1 1/32	

**Bulkhead Adapter: BA/MM connects metric tube to metric port**

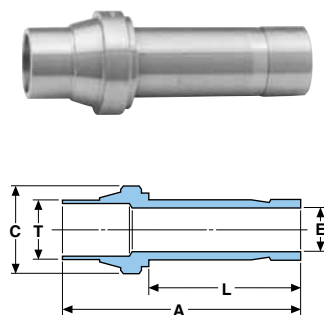
Part Number*	T Tube O.D.	Dimensions – mm										Panel Hole Size	Max. Panel Thick.
		A	B Hex Flat	C Hex Flat	D	E	Fx	G	J Hex Flat	L			
3BA3[ ]MM	3	55.1	11.1	12.7	14.3	2.1	32.5	47.1	12.7	15.9	8.3	12.0	
4BA4[ ]MM	4	56.7	12.7	14.3	15.1	2.3	33.2	48.9	14.3	16.7	10.0	12.0	
6BA6[ ]MM	6	58.7	14.3	15.9	16.3	3.8	34.6	50.3	15.9	17.3	11.5	13.0	
8BA8[ ]MM	8	62.9	15.9	17.5	16.7	5.8	36.6	54.9	17.5	19.1	13.1	14.0	
10BA10[ ]MM	10	64.1	19.1	19.1	17.5	7.5	37.3	56.1	19.1	19.9	16.5	14.0	
12BA12[ ]MM	12	75.4	22.2	23.8	24.6	9.1	43.7	63.5	23.8	24.5	19.5	16.0	
14BA14[ ]MM	14	75.0	23.8	23.8	22.2	11.9	41.1	63.0	23.8	24.5	19.5	16.0	
16BA16[ ]MM	16	79.0	25.4	27.0	25.0	12.7	43.7	68.0	27.0	27.3	22.5	14.0	
18BA18[ ]MM	18	86.0	28.6	30.0	25.4	13.8	48.0	75.0	30.2	28.2	26.0	17.0	
22BA22[ ]MM	22	92.0	31.8	33.5	27.0	17.9	53.0	81.0	33.3	30.0	29.5	24.0	
25BA25[ ]MM	25	105.0	38.1	40.0	33.3	18.1	60.0	91.0	39.7	35.4	33.8	24.0	



\* [ ] see page 6 for material specifications.

## Port Connector: PC

connects two fractional ports



PART NUMBER*	T TUBE OD	DIMENSIONS – INCHES			
		A	C	E	L
1PC[]	1/16	0.74	0.13	0.03	0.54
2PC[]	1/8	1.10	0.25	0.09	0.73
3PC[]	3/16	1.10	0.32	0.19	0.74
4PC[]	1/4	1.24	0.38	0.19	0.84
6PC[]	3/8	1.33	0.50	0.28	0.88
8PC[]	1/2	1.92	0.69	0.39	1.23
10PC[]	5/8	1.96	0.82	0.50	1.25
12PC[]	3/4	1.83	0.94	0.59	1.13
14PC[]	7/8	2.20	1.10	0.69	1.38
16PC[]	1.0	2.57	1.20	0.80	1.63

## Port Connector: PC/MM

connects two metric ports

PART NUMBER*	T TUBE OD	DIMENSIONS – MM			
		A	C	E	L
3PC[]MM	3	27.9	6.4	2.2	18.3
4PC[]MM	4	26.1	7.6	2.4	16.7
6PC[]MM	6	31.4	9.3	2.8	21.2
8PC[]MM	8	31.1	11.1	6.4	20.7
10PC[]MM	10	34.2	13.2	7.6	22.6
12PC[]MM	12	48.6	17.5	9.2	31.0
14PC[]MM	14	43.2	19.1	11.1	27.0
15PC[]MM	15	44.5	19.1	11.9	28.6
16PC[]MM	16	50.4	20.7	12.7	31.8
18PC[]MM	18	51.4	23.8	13.9	33.3
20PC[]MM	20	60.6	26.9	15.1	41.3
22PC[]MM	22	54.1	26.9	17.1	34.4
25PC[]MM	25	66.0	31.5	19.5	41.7

### Installation Instructions

#### For Port Connector and Reducing Port Connector:

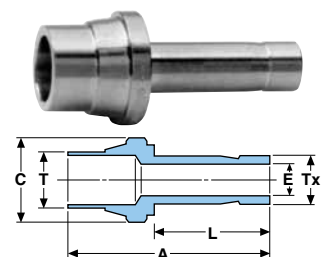
1. Firmly insert machined ferrule end into fitting body.
2. Place nut only (no ferrules) over the machined ferrule. Finger-tighten.
3. Using wrench, turn nut until sharp rise in torque is felt. Snug tight. (Do not tighten 1¼ turns. No ferrules to set.)
4. Insert tube stub end into HOKE GYROLOK® assembly. Follow standard HOKE GYROLOK® assembly instructions, page 53.

HOKE GYROLOK® ended ball valve using port connector for close connection to another port.



## Reducing Port Connector: PC

connects two fractional ports



Part Number*	T Tube O.D.	Tx Tube Reduced O.D.	Dimensions – inches			
			A	C	E	L
2PC1 []	1/8	1/16	.84	.25	.03	.47
4PC1 []	1/4	1/16	.95	.38	.03	.56
4PC2 []	1/4	1/8	1.06	.38	.06	.66
6PC2 []	3/8	1/8	1.16	.50	.09	.70
6PC4 []	3/8	1/4	1.22	.50	.13	.78
8PC4 []	1/2	1/4	1.47	.69	.13	.77
8PC6 []	1/2	3/8	1.55	.69	.25	.83
12PC8 []	3/4	1/2	2	.94	.33	1.14

## Reducing Port Connector: PC/MM

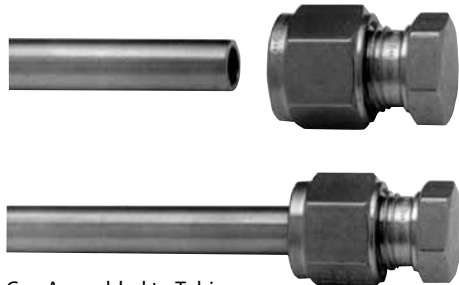
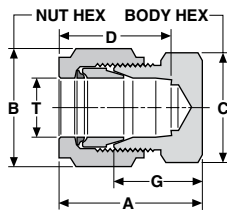
connects two metric ports

Part Number*	T Tube O.D.	Tx Tube Reduced O.D.	Dimensions – mm			
			A	C	E	L
6PC3[]MM	6	3	29.9	9.3	2.1	18.1
8PC6[]MM	8	6	29.4	11.2	4.4	19.0
10PC6[]MM	10	6	31.1	13.2	4.4	19.8
10PC8[]MM	10	8	33.7	13.2	6.4	22.2
12PC6[]MM	12	6	39.0	17.5	4.4	21.2
12PC8[]MM	12	8	40.6	17.5	6.4	23.0
12PC10[]MM	12	10	39.4	17.5	7.5	21.7
16PC12[]MM	16	12	50.2	20.7	9.2	31.5
18PC16[]MM	18	16	50.4	24.0	12.7	32.3
22PC18[]MM	22	18	53.6	27.5	13.9	34.0
25PC18[]MM	25	18	58.4	32.0	13.9	34.1

\* [] see page 6 for material specifications.



Fractional shown



Cap Assembled to Tubing

**Assembly Instructions:**

1. Insert tube into cap.
2. Follow standard HOKE GYROLOK® assembly instructions, page 53.

**Cap: CP**

caps end of fractional tube

art Number*	T Tube O.D.	Dimensions — inches				
		A	B Hex Flat	C Hex Flat	D	G
1CP [ ]	1/16	.66	5/16	5/16	.41	.44
2CP [ ]	1/8	.91	7/16	7/16	.56	.53
3CP [ ]	3/16	.89	1/2	7/16	.59	.58
4CP [ ]	1/4	.95	9/16	1/2	.64	.63
6CP [ ]	3/8	1.06	11/16	5/8	.72	.72
8CP [ ]	1/2	1.28	7/8	13/16	.97	.81
10CP [ ]	5/8	1.33	1	15/16	1	.89
12CP [ ]	3/4	1.36	1 1/8	1 1/16	1	.92
14CP [ ]	7/8	1.41	1 1/4	1 3/16	1.06	.97
16CP [ ]	1	1.77	1 1/2	1 3/8	1.31	1.20
20CP [ ]	1 1/4	2.10	1 7/8	1 3/4	1.53	1.23
24CP [ ]	1 1/2	2.54	2 1/4	2 1/8	1.78	1.47
32CP [ ]	2	3.41	3	2 3/4	2.47	1.94

**Tube Cap: CP/MM**

caps end of metric tube

Part Number*	T Tube O.D.	Dimensions — mm				
		A	B Hex Flat	C Hex Flat	D	G
3CP [ ]MM	3	22.8	11.1	11.1	14.3	14.8
4CP [ ]MM	4	23.6	12.7	11.1	15.1	15.8
6CP [ ]MM	6	25.3	14.3	12.7	16.3	16.9
8CP [ ]MM	8	25.1	15.9	14.3	16.7	17.1
10CP [ ]MM	10	26.2	19.1	17.5	17.5	18.3
12CP [ ]MM	12	32.6	22.2	20.6	24.6	20.6
14CP [ ]MM	14	31.6	23.8	22.2	22.2	22.2
15CP [ ]MM	15	31.9	23.8	22.2	22.2	21.5
16CP [ ]MM	16	35.0	25.4	23.8	25.0	23.9
18CP [ ]MM	18	33.4	28.6	27.0	25.4	23.4
20CP [ ]MM	20	40.0	31.8	30.2	31.0	25.2
22CP [ ]MM	22	35.8	31.8	30.2	27.0	24.6
25CP [ ]MM	25	45.9	38.1	34.9	33.3	31.5
30CP [ ]MM	30	53.4	50.8	46	39.6	31.8
32CP [ ]MM	32	55.8	50.8	46	42	32.8
38CP [ ]MM	38	65.4	60.3	55	49.4	37.8

**Plug: P fractional for GYROLOK® ports**

Dimensions — inches

Part Number*	Dimensions — inches	
	A Fitting Size	B Hex Size
1P [ ]	1/16	5/16
2P [ ]	1/8	7/16
3P [ ]	3/16	1/2
4P [ ]	1/4	9/16
6P [ ]	3/8	11/16
8P [ ]	1/2	7/8
10P [ ]	5/8	1
12P [ ]	3/4	1 1/8
14P [ ]	7/8	1 1/4
16P [ ]	1	1 1/2
20P [ ]	1 1/4	1 7/8
24P [ ]	1 1/2	2 1/4
32P [ ]	2	3

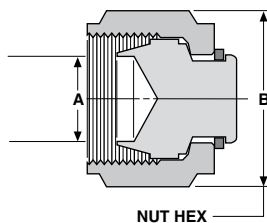
**Plug: P/MM metric for GYROLOK® ports**

Dimensions — mm

Part Number*	Dimensions — mm	
	A Fitting Size	B Hex Size
3P [ ]MM	3	11.1
4P [ ]MM	4	12.7
6P [ ]MM	6	14.3
8P [ ]MM	8	15.9
10P [ ]MM	10	19.1
12P [ ]MM	12	22.2
14P [ ]MM	14	23.8
15P [ ]MM	15	23.8
16P [ ]MM	16	25.4
18P [ ]MM	18	28.6
20P [ ]MM	20	31.8
22P [ ]MM	22	31.8
25P [ ]MM	25	38.1
30P [ ]MM	30	50.8
32P [ ]MM	32	50.8
38P [ ]MM	38	60.3



Fractional shown


**Usage Instructions:**

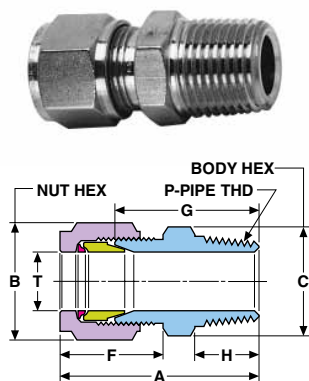
1. Remove nut and ferrules from body.
2. Place plug assembly onto HOKE GYROLOK® fitting body. Tighten to hand-tight condition.
3. Turn nut with wrench until sharp rise in torque. Then snug tight. (Do not tighten 1 1/4 turns. No ferrules to set).



Plug Assembled to HOKE GYROLOK® Body

\* [ ] see page 6 for material specifications.

## Male Thermocouple Connector: CMT (Fractional)



Part Number*	T P		Dimensions — inches					
	Tube O.D.	Pipe Thd.	A	Hex Flat B	Hex Flat C	F	G	H
1CMT1[ ]	1/16	1/16	.97	5/16	5/16	.48	.75	.38
1CMT2[ ]	1/16	1/8	1.13	5/16	7/16	.48	.81	.38
1CMT4[ ]	1/16	1/4	1.22	5/16	9/16	.48	1	.56
2CMT2[ ]	1/8	1/8	1.22	7/16	7/16	.67	.91	.38
2CMT4[ ]	1/8	1/4	1.44	7/16	9/16	.67	1.13	.56
3CMT2[ ]	3/16	1/8	1.27	1/2	7/16	.70	.95	.38
3CMT4[ ]	3/16	1/4	1.50	1/2	9/16	.70	1.19	.56
4CMT2[ ]	1/4	1/8	1.33	9/16	1/2	.77	1	.38
4CMT4[ ]	1/4	1/4	1.52	9/16	9/16	.77	1.19	.56
4CMT6[ ]	1/4	3/8	1.58	9/16	11/16	.77	1.25	.56
4CMT8[ ]	1/4	1/2	1.80	9/16	7/8	.77	1.47	.75
6CMT4[ ]	3/8	1/4	1.64	11/16	5/8	.83	1.28	.56
6CMT6[ ]	3/8	3/8	1.63	11/16	11/16	.83	1.28	.56
6CMT8[ ]	3/8	1/2	1.84	11/16	7/8	.83	1.50	.75
8CMT8[ ]	1/2	1/2	1.97	7/8	7/8	.92	1.50	.75
12CMT12[ ]	3/4	3/4	2.08	1 1/8	1 1/16	.97	1.63	.75
20CMT20[ ]	1 1/4	1 1/4	3.06	1 7/8	1 7/8	1.56	2.17	.94

The CMT body does not contain a sizing angle or butt seal. As a result, the thermocouple can be extended beyond the fitting's NPT thread end.

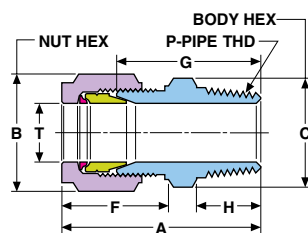
Example: HOKE GYROLOK® CMT assembled to thermocouple.



### Assembly Instruction:

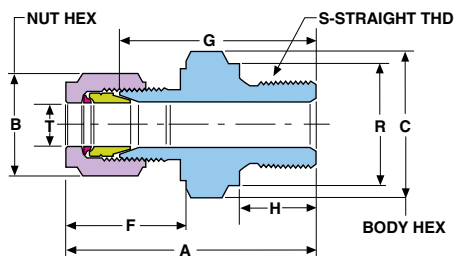
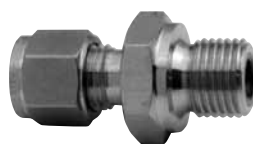
Because the thermocouple is not bottomed out within the fitting body, follow these simple steps before carrying out HOKE GYROLOK® assembly instructions on page 53.

1. Position the length of the thermocouple to extend past the fitting's NPT end.
2. Once correctly positioned, carefully hold thermocouple in place to prevent shifting during assembly



## Male Thermocouple Connector: CMT/ME, CMT/MC (Metric) Metric Tube with NPT or RT tapered threads

Part Number*	T P		Dimensions — mm						
	Tube O.D.	Pipe Thd.	A	Hex Flat B	Hex Flat C	F	G	H	
6CMT2[ ]ME	6CMT2[ ]MC	6	1/8	34.8	14.3	12.7	19.5	26.4	9.5
6CMT4[ ]ME	6CMT4[ ]MC	6	1/4	39.5	14.3	14.3	19.5	31.2	14.3
8CMT4[ ]ME	8CMT4[ ]MC	8	1/4	39.8	15.9	14.3	19.1	31.8	14.2



## Male Thermocouple Connector: CMT/MA (Metric) Metric Tube with RS parallel threads

Part Number*	T S		Dimensions — mm						
	Tube O.D.	Straight Thd.	A	Hex Flat B	Hex Flat C	F	G	H	R
6CMT4[ ]MA	6	1/4	40.1	14.3	19.1	19.5	31.8	12.0	18.0

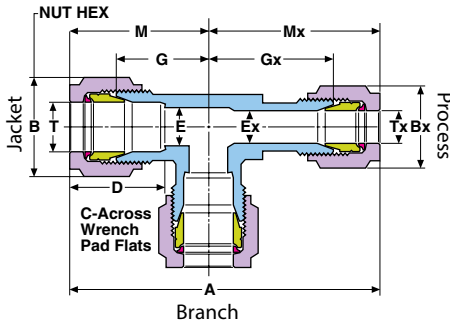
RS parallel thread ends are typically used with a gasket having a bonded elastomer seal. RP-type gaskets may also be used.

\* [ ] see page 6 for material specifications.

## Heat Exchanger Tee: XT



Part Number*	T Tube		Tx Tube		Dimensions — inches								
	O.D.	O.D.	A	Hex Flat	Bx	C	D	E	Ex	G	Gx	M	Mx
4XT2[ ]BR4	1/4	1/8	2.02	9/16	7/16	7/16	.64	.19	.13	.72	.66	1.05	.97
8XT4[ ]BR4	1/2	1/4	2.73	7/8	9/16	11/16	.97	.42	.25	.97	.97	1.44	1.30
8XT4[ ]BR8	1/2	1/4	2.73	7/8	9/16	11/16	.97	.42	.25	.97	.91	1.44	1.23



### Special Ordering Instructions:

Heat Exchanger Tees are available in other fractional and metric sizes by special order. Ask your HOKE distributor for price and availability information. Specify "Heat Exchanger Tee" followed by quantity and the desired tube connection sizes.

### Example

#### 8XT4[ ]BR8

1. Jacket and tubing O.D.
2. Process tubing O.D.
3. Specify material
4. Branch tubing O.D.
5. Metric

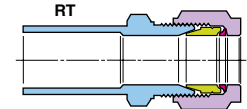
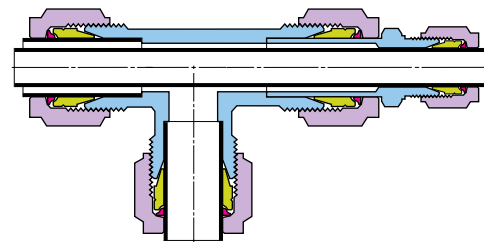
### Standard Fitting

- 1/2"
- 1/4"
- \*
- 1/2"
- 

## Heat Exchanger Tee Made With HOKE GYROLOK® Tube Fittings



Assembly of Tee  
Union Tees With Full Port Reducer



Heat exchanger tees made with HOKE **GYROLOK**® tube fittings can provide additional flexibility as well as reduce costly fitting inventories.

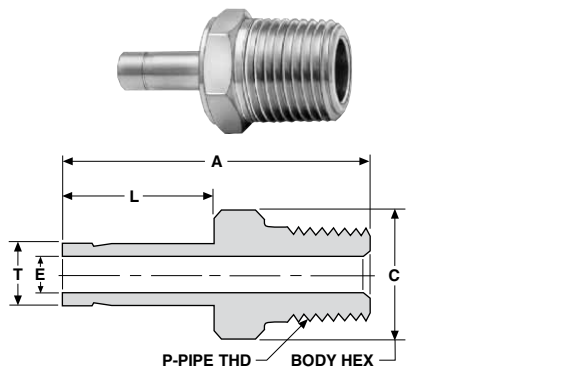
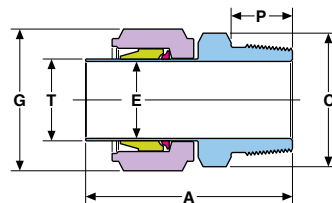
### Ordering Instructions

Heat Exchanger Tees can be created with standard union tees and full port reducers to allow process tubing to be inserted into and through the jacket tubing.

To order a full port reducer, add the letter "T" to the core reducer part number.

**Example:** 8RT12 316

\* [ ] see page 6 for material specifications.

**Male Adapter: AM (Fractional)**

**20AM20[ ] shown**


Over 1 inch and over 25 mm Male Adapters feature pre-set ferrules.  
Follow HOKE GYROLOK® Reassembly instructions, page 53.

Part Number*	Dimensions — inches		C			
	T Tube O.D.	P Male NPT Size	A	Hex Flat	E	L
1AM1[ ]	1/16	1/16	1	5/16	.03	.47
1AM2[ ]	1/16	1/8	1	7/16	.03	.47
2AM2[ ]	1/8	1/8	1.16	7/16	.09	.63
2AM4[ ]	1/8	1/4	1.34	9/16	.09	.63
3AM2[ ]	3/16	1/8	1.19	7/16	.13	.66
3AM4[ ]	3/16	1/4	1.38	9/16	.13	.66
4AM2[ ]	1/4	1/8	1.25	7/16	.19	.69
4AM4[ ]	1/4	1/4	1.44	9/16	.19	.69
4AM6[ ]	1/4	3/8	1.47	11/16	.19	.69
4AM8[ ]	1/4	1/2	1.69	7/8	.19	.69
6AM2[ ]	3/8	1/8	1.38	7/16	.28	.78
6AM4[ ]	3/8	1/4	1.56	9/16	.28	.78
6AM6[ ]	3/8	3/8	1.56	11/16	.28	.78
6AM8[ ]	3/8	1/2	1.78	7/8	.28	.78
8AM4[ ]	1/2	1/4	1.75	9/16	.39	.97
8AM6[ ]	1/2	3/8	1.78	11/16	.39	.97
8AM8[ ]	1/2	1/2	1.97	7/8	.39	.97
8AM12[ ]	1/2	3/4	1.98	1 1/16	.39	.97
10AM6[ ]	5/8	3/8	1.89	11/16	.50	1.08
10AM8[ ]	5/8	1/2	2.08	7/8	.50	1.08
10AM12[ ]	5/8	3/4	2.14	1 1/16	.50	1.08
12AM8[ ]	3/4	1/2	2.13	7/8	.59	1.13
12AM12[ ]	3/4	3/4	2.16	1 1/16	.59	1.13
12AM16[ ]	3/4	1	2.31	1 3/8	.59	1.13
14AM12[ ]	7/8	3/4	2.22	1 1/16	.69	1.19
16AM12[ ]	1	3/4	2.39	1 1/16	.80	1.38
16AM16[ ]	1	1	2.61	1 3/8	.80	1.38
20AM20[ ]	1 1/4	1 1/4	3.16	1 3/4	1.09	1.72
24AM24[ ]	1 1/2	1 1/2	3.72	2 1/8	1.31	2.06
32AM32[ ]	2	2	4.70	2 3/4	1.75	2.76

**Male Adapter: AM/MC/ME (Metric) with RT Ends**

Part Number*	Dimensions — mm		C				
	T Tube O.D.	P Pipe Thd.	A	Hex Flat	E	L	
3AM2[ ]MC	3AM2[ ]ME	3	1/8	31.2	11.1	2.1	15.9
3AM4[ ]MC	3AM4[ ]ME	3	1/4	36.7	13.7	2.1	15.9
4AM2[ ]MC	4AM2[ ]ME	4	1/8	32.0	11.1	2.3	16.7
4AM4[ ]MC	4AM4[ ]ME	4	1/4	36.8	14.3	2.3	16.7
6AM2[ ]MC	6AM2[ ]ME	6	1/8	32.6	11.1	4.4	17.3
6AM4[ ]MC	6AM4[ ]ME	6	1/4	37.4	14.3	4.4	17.3
6AM6[ ]MC	6AM6[ ]ME	6	3/8	37.2	17.5	4.4	17.3
6AM8[ ]MC	6AM8[ ]ME	6	1/2	42.7	22.2	4.4	17.3
8AM2[ ]MC	8AM2[ ]ME	8	1/8	34.3	11.1	4.4	19.1
8AM4[ ]MC	8AM4[ ]ME	8	1/4	39.9	14.3	6.2	19.1
8AM6[ ]MC	8AM6[ ]ME	8	3/8	39.9	17.5	6.2	19.1
8AM8[ ]MC	8AM8[ ]ME	8	1/2	46.2	22.2	6.2	19.1
10AM2[ ]MC	10AM2[ ]ME	10	1/8	35.9	11.1	4.6	19.8
10AM4[ ]MC	10AM4[ ]ME	10	1/4	39.9	14.3	7.5	19.8
10AM6[ ]MC	10AM6[ ]ME	10	3/8	40.1	17.5	7.5	19.8
10AM8[ ]MC	10AM8[ ]ME	10	1/2	45.2	22.2	7.5	19.8
12AM4[ ]MC	12AM4[ ]ME	12	1/4	45.5	14.3	7.0	24.5
12AM6[ ]MC	12AM6[ ]ME	12	3/8	46.3	17.5	9.1	24.5
12AM8[ ]MC	12AM8[ ]ME	12	1/2	49.9	22.2	9.1	24.5
14AM4[ ]MC	14AM4[ ]ME	14	1/4	45.1	19.1	7.1	24.5
14AM6[ ]MC	14AM6[ ]ME	14	3/8	45.1	19.1	10.2	24.5
14AM8[ ]MC	14AM8[ ]ME	14	1/2	49.9	22.2	11.0	24.5
15AM8[ ]MC	15AM8[ ]ME	15	1/2	50.8	22.2	11.9	24.5
16AM6[ ]MC	16AM6[ ]ME	16	3/8	48.0	17.5	12.6	27.3
16AM8[ ]MC	16AM8[ ]ME	16	1/2	52.7	22.2	12.6	27.3
16AM12[ ]MC	16AM12[ ]ME	16	3/4	54.0	27.0	12.6	27.3
16AM16[ ]MC	16AM16[ ]ME	16	1	58.6	34.9	12.6	27.3
18AM6[ ]MC	18AM6[ ]ME	18	3/8	55.0	17.5	13.8	28.2
18AM8[ ]MC	18AM8[ ]ME	18	1/2	60.0	22.2	13.8	28.2
18AM12[ ]MC	18AM12[ ]ME	18	3/4	55.4	27.0	13.8	28.2
20AM8[ ]MC	20AM8[ ]ME	20	1/2	60.7	22.2	12.6	33.4
20AM12[ ]MC	20AM12[ ]ME	20	3/4	60.5	27.0	15.1	33.4
22AM8[ ]MC	22AM8[ ]ME	22	1/2	53.0	27.0	15.8	30.0
22AM12[ ]MC	22AM12[ ]ME	22	3/4	61.0	27.0	15.8	30.0
25AM8[ ]MC	25AM8[ ]ME	25	1/2	61.0	27.0	12.6	35.4
25AM12[ ]MC	25AM12[ ]ME	25	3/4	66.8	27.0	15.8	36.0
25AM16[ ]MC	25AM16[ ]ME	25	1	66.8	34.9	19.5	35.5

**Eliminate Alignment Problems—Use Adapters**
**Female Pipe Port**


**Example:** Need to join tubing and a female NPT port at 90° angle to one another.

**Male Elbow**


**Problem:** With the NPT end properly torqued, the tube fitting end of a male elbow may not properly line up with the tubing.

**Male Adapter**


**Solution:** Use a male adapter and union elbow. Tighten pipe thread of male adapter to convert the female port into a tube stub end.

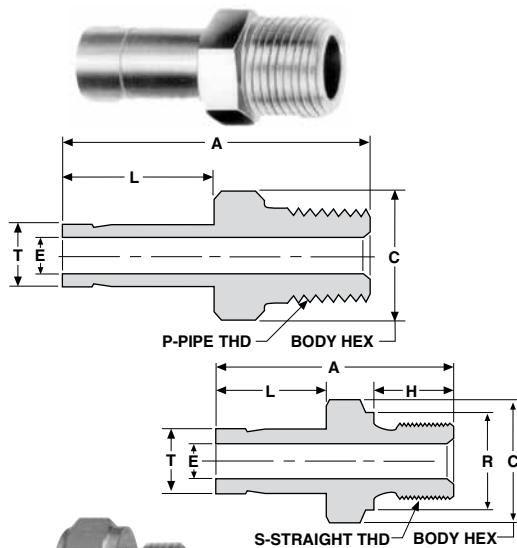
**Union Elbow**


**Assembly:**  
1. To connect union elbow to adapter, hold elbow pointing in desired direction and follow standard HOKE GYROLOK® assembly Instructions on page 53.

2. Insert tubing into other end of the union elbow and properly connect tubing.

\* [ ] see page 6 for material specifications.





### Male Adapter: AM/EC (Fractional)

connects fractional port to female RT tapered threads

Part Number*	Dimensions — inches					
	T Tube O.D.	P Pipe Thd.	C			
4AM2[ ]EC	1/4	1/8	1.25	7/16	.19	.69
4AM4[ ]EC	1/4	1/4	1.44	9/16	.19	.69
6AM4[ ]EC	3/8	1/4	1.56	9/16	.28	.78
6AM6[ ]EC	3/8	3/8	1.56	11/16	.28	.78
6AM8[ ]EC	3/8	1/2	1.78	7/8	.28	.78
8AM8[ ]EC	1/2	1/2	1.97	7/8	.39	.97

### Male Adapter: AM/EA

connects fractional port to female RS parallel threads

Part Number*	Dimensions — inches							
	T Tube O.D.	S Thd. Size	C					
4AM2[ ]EA	1/4	1/8	1.31	5/8	.19	.31	.69	.55
4AM4[ ]EA	1/4	1/4	1.39	3/4	.19	.47	.69	.70
6AM6[ ]EA	3/8	3/8	1.53	15/16	.28	.47	.78	.86
8AM8[ ]EA	1/2	1/2	1.86	1 3/32	.39	.55	.97	1.03

### Male Adapter: AM/MB

connects metric port to female ISO straight thread

Part Number*	Dimensions — mm									
	T Tube O.D.	S Thd. Size	C							
6AM4[ ]MB	6	1/4	38.1	19.1	4.4	12.0	17.3	18.0	17.0	
12AM8[ ]MB	12	1/2	40.1	27.0	9.1	14.0	24.5	26.0	25.0	

### O-ring Male Adapter: AOM

connects fractional port to female NPT threads

Part Number*	Dimensions — inches										
	T Tube O.D.	P Pipe Size	C								O-ring
1AOM2[ ]	1/16	1/8	1.03	3/4	.03	.28	.47	.75	7/16	5/8	
2AOM2[ ]	1/8	1/8	1.23	3/4	.09	.28	.63	.75	7/16	5/8	
2AOM4[ ]	1/8	1/4	1.36	15/16	.09	.38	.63	.94	9/16	3/4	
3AOM2[ ]	3/16	1/8	1.25	3/4	.13	.28	.66	.75	7/16	5/8	
3AOM4[ ]	3/16	1/4	1.38	15/16	.13	.38	.66	.94	9/16	3/4	
4AOM2[ ]	1/4	1/8	1.31	3/4	.13	.28	.69	.75	7/16	5/8	
4AOM4[ ]	1/4	1/4	1.44	15/16	.19	.38	.69	.94	9/16	3/4	
4AOM6[ ]	1/4	3/8	1.50	1 1/8	.19	.41	.69	1.13	3/4	15/16	
6AOM2[ ]	3/8	1/8	1.38	3/4	.25	.28	.78	.75	7/16	5/8	
6AOM4[ ]	3/8	1/4	1.52	15/16	.28	.38	.78	.94	9/16	3/4	

### O-ring Male Adapter: AOM/ME

connects metric port to female NPT threads

Part Number*	Dimensions — mm										
	T Tube O.D.	P Pipe Size	C								O-ring
6AOM2[ ]ME	6	1/8	32.8	19.1	4.4	7.3	17.3	18.6	11.5	16.6	
6AOM4[ ]ME	6	1/4	37.6	23.8	4.4	9.7	17.3	23.4	14.7	19.7	
10AOM4[ ]ME	10	1/4	40.1	23.8	7.0	9.7	19.8	23.4	14.7	19.7	
10AOM6[ ]ME	10	3/8	40.9	28.6	7.5	10.4	19.8	28.1	19.4	24.5	
12AOM6[ ]ME	12	3/8	45.2	28.6	9.1	10.4	24.5	28.1	19.4	24.3	
12AOM8[ ]ME	12	1/2	50.8	33.3	9.1	13.6	24.4	32.9	25.6	25.9	

### O-ring Straight Adapter: AOS

connects fractional port to female O-ring straight thread

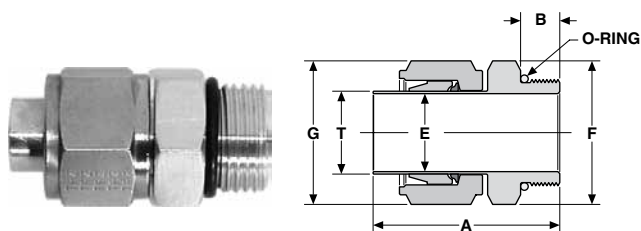
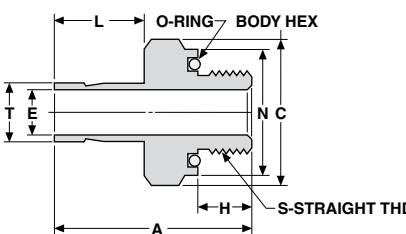
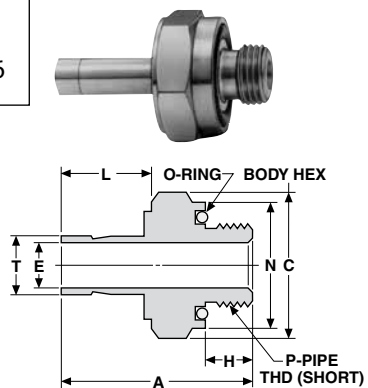
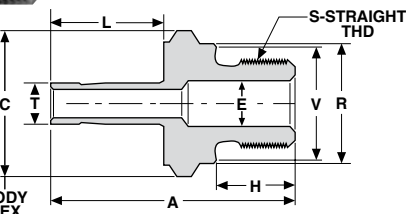
Part Number*	Dimensions — inches										
	T Tube O.D.	S Thd. Size	C								O-ring
1AOS[ ]	1/16	5/16-24	1.06	9/16	.03	.34	.47	.56	.31	.44	
2AOS[ ]	1/8	5/16-24	1.25	9/16	.09	.34	.63	.56	.31	.44	
3AOS[ ]	3/16	3/8-24	1.34	5/8	.13	.38	.66	.63	.38	.50	
4AOS[ ]	1/4	7/16-20	1.44	3/4	.19	.41	.69	.75	.44	.63	
6AOS[ ]	3/8	9/16-18	1.61	15/16	.28	.47	.78	.94	.56	.75	
8AOS[ ]	1/2	3/4-16	1.84	1 1/8	.39	.47	.97	1.13	.75	.94	

### Male SAE Adapter: AMS

connects fractional port to SAE/MS straight thread boss

Part Number	Dimensions — inches							
	T Tube O.D.	S Thd. Size	A	B	E	F	G	O-ring
20AMS20316	1 1/4	1 5/8-12	2.81	.59	1.17	1 7/8	1.88	-920
24AMS24316	1 1/2	1 7/8-12	3.28	.59	1.30	2 1/8	2.25	-924
32AMS32316	2	2 1/2-12	4.24	.59	1.75	2 3/4	3	-932

To specify O-ring material, see page 6

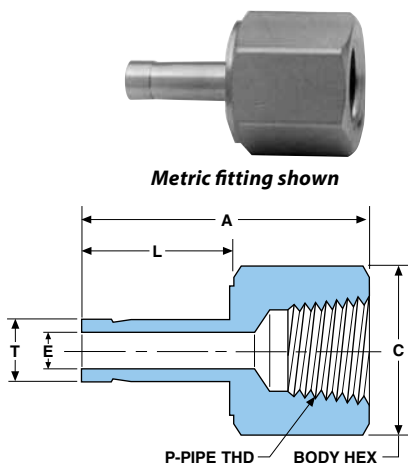


\* [ ] see page 6 for material specifications.

Follow the HOKE GYROLOK® remake instructions, page 8.

## Female Adapter: AF

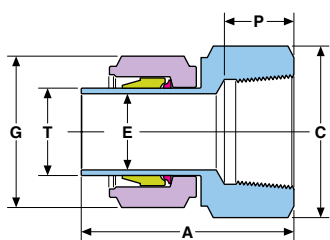
connects fractional port to male NPT thread



Part Number*	T Tube O.D.	P Pipe Size	Dimensions — inches				
			A	C Hex Flat	E	G Hex Flat	L
2AF2 [ ]	1/8	1/8	1.14	9/16	.09	—	.63
2AF4 [ ]	1/8	1/4	1.31	3/4	.09	—	.63
3AF2 [ ]	3/16	1/8	1.25	9/16	.13	—	.66
3AF4 [ ]	3/16	1/4	1.41	3/4	.13	—	.66
4AF2 [ ]	1/4	1/8	1.22	9/16	.19	—	.69
4AF4 [ ]	1/4	1/4	1.41	3/4	.19	—	.69
4AF6 [ ]	1/4	3/8	1.44	7/8	.19	—	.69
4AF8 [ ]	1/4	1/2	1.63	1 1/16	.19	—	.69
6AF2 [ ]	3/8	1/8	1.31	9/16	.28	—	.78
6AF4 [ ]	3/8	1/4	1.50	3/4	.28	—	.78
6AF6 [ ]	3/8	3/8	1.53	7/8	.28	—	.78
6AF8 [ ]	3/8	1/2	1.72	1 1/16	.28	—	.78
8AF4 [ ]	1/2	1/4	1.69	3/4	.39	—	.97
8AF6 [ ]	1/2	3/8	1.72	7/8	.39	—	.97
8AF8 [ ]	1/2	1/2	1.91	1 1/16	.39	—	.97
10AF6 [ ]	5/8	3/8	1.81	7/8	.50	—	1.08
10AF8 [ ]	5/8	1/2	2	1 1/16	.50	—	1.08
10AF12 [ ]	5/8	3/4	2.09	1 1/4	.50	—	1.08
12AF8 [ ]	3/4	1/2	2.06	1 1/16	.59	—	1.13
12AF12 [ ]	3/4	3/4	2.13	1 1/4	.59	—	1.13
12AF16 [ ]	3/4	1	2.44	1 5/8	.59	—	1.13
14AF12 [ ]	7/8	3/4	2.19	1 1/4	.69	—	1.19
16AF8 [ ]	1	1/2	2.28	1 1/16	.80	—	1.38
16AF12 [ ]	1	3/4	2.38	1 1/4	.80	—	1.38
16AF16 [ ]	1	1	2.63	1 5/8	.80	—	1.38
20AF20 [ ]	1 1/4	1 1/4	3.06	2 1/8	1.09	1 7/8	—
24AF24 [ ]	1 1/2	1 1/2	3.50	2 3/8	1.31	2	—
32AF32 [ ]	2	2	4.53	2 7/8	1.75	3	—



20AF20 [ ] shown



Over 1 inch and over 25 mm Female Adapters feature pre-set ferrules. Use the HOKE GYROLOK® remake instructions, page 53.

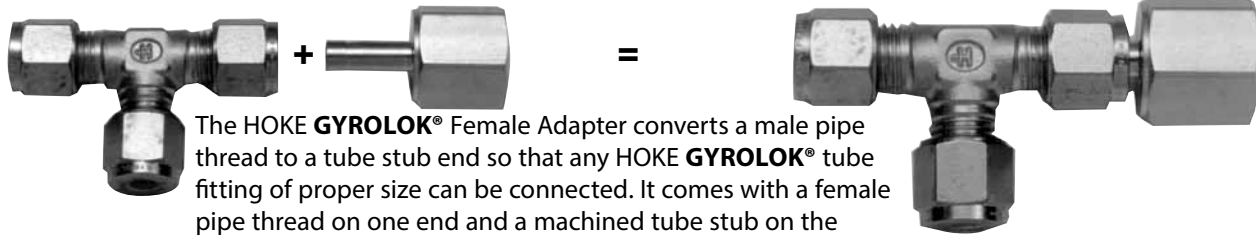
## Female Adapter: AF/ME

connects metric port to male NPT thread

Part Number*	T Tube O.D.	P Pipe Size	Dimensions — mm			
			A	C Hex Flat	E	L
3AF2 [ ]ME	3	1/8	28.8	14.3	2.1	15.9
3AF4 [ ]ME	3	1/4	33.3	19.1	2.1	15.9
6AF2 [ ]ME	6	1/8	30.9	14.3	4.4	17.3
6AF4 [ ]ME	6	1/4	35.7	19.1	4.4	17.3
6AF6 [ ]ME	6	3/8	36.5	22.2	4.4	17.3
6AF8 [ ]ME	6	1/2	41.3	27.0	4.4	17.3
8AF2 [ ]ME	8	1/8	32.8	14.3	6.2	19.1
8AF4 [ ]ME	8	1/4	37.5	19.1	6.2	19.1
8AF6 [ ]ME	8	3/8	40.4	22.2	6.2	19.1
8AF8 [ ]ME	8	1/2	43.9	27.0	6.2	19.1
10AF2 [ ]ME	10	1/8	33.3	14.3	7.5	19.8
10AF4 [ ]ME	10	1/4	38.1	19.1	7.5	19.8
10AF6 [ ]ME	10	3/8	38.9	22.2	7.5	19.8
10AF8 [ ]ME	10	1/2	43.7	27.0	7.5	19.8
12AF4 [ ]ME	12	1/4	42.9	19.1	9.1	24.5
12AF6 [ ]ME	12	3/8	44.7	22.2	9.1	24.5
12AF8 [ ]ME	12	1/2	48.4	27.0	9.1	24.5
12AF12 [ ]ME	12	3/4	53.3	31.8	9.1	24.5
14AF4 [ ]ME	14	1/4	43.0	19.1	10.2	24.5
14AF8 [ ]ME	14	1/2	47.5	27.0	11.0	24.5
15AF8 [ ]ME	15	1/2	48.4	27.0	11.9	24.5
16AF6 [ ]ME	16	3/8	46.0	22.2	12.6	27.3
16AF8 [ ]ME	16	1/2	50.8	27.0	12.6	27.3
16AF12 [ ]ME	16	3/4	53.0	31.8	12.6	27.3
18AF6 [ ]ME	18	3/8	49.0	22.2	13.8	28.2
18AF8 [ ]ME	18	1/2	51.8	27.0	13.8	28.2
18AF12 [ ]ME	18	3/4	56.0	31.8	13.8	28.2
20AF8 [ ]ME	20	1/2	57.2	27.0	15.1	33.4
20AF12 [ ]ME	20	3/4	58.7	31.8	15.1	33.4
22AF8 [ ]ME	22	1/2	54.0	27.0	15.8	30.0
22AF12 [ ]ME	22	3/4	56.0	31.8	15.8	30.0
25AF8 [ ]ME	25	1/2	60.0	27.0	19.3	35.5
25AF12 [ ]ME	25	3/4	61.7	31.8	19.3	35.5
25AF16 [ ]ME	25	1	67.2	41.3	19.5	35.5

\* [ ] see page 6 for material specifications.

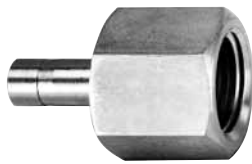
## Union Tee Plus Adapter Assemblies Help Eliminate Costly Inventory



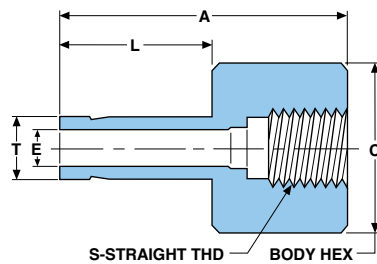
The HOKE **GYROLOK**® Female Adapter converts a male pipe thread to a tube stub end so that any HOKE **GYROLOK**® tube fitting of proper size can be connected. It comes with a female pipe thread on one end and a machined tube stub on the other. By using adapters with union tees, you'll need fewer male or female branch tees and run tees.

### Female Adapter: AF/EZ

connects **fractional** port to male RG parallel threads (gauge)



Fractional fitting shown



Part Number*	T	S	Dimensions — inches			
	Tube O.D.	Thd. Size	A	Hex Flat	E	L
4AF4[ ]EZ	1/4	1/4	1.42	3/4	.19	.69
4AF8[ ]EZ	1/4	1/2	1.83	1 1/16	.19	.69
8AF4[ ]EZ	1/2	1/4	1.53	3/4	.22	.97
8AF8[ ]EZ	1/2	1/2	2	1 1/16	.28	.97

### Female Adapter: AF/MZ

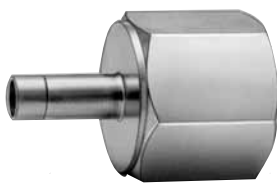
connects **metric** port to male RG parallel threads (gauge)

Part Number*	T	S	Dimensions — mm			
	Tube O.D.	Straight Thd.	A	Hex Flat	E	L
6AF4[ ]MZ	6	1/4	37.0	19.1	4.5	17.3
6AF8[ ]MZ	6	1/2	46.3	27.0	4.5	17.3
8AF4[ ]MZ	8	1/4	35.7	19.1	5.5	19.1
8AF8[ ]MZ	8	1/2	47.2	27.0	6.4	19.1
10AF4[ ]MZ	10	1/4	36.5	19.1	5.5	19.8
10AF8[ ]MZ	10	1/2	47.4	30.2	7.0	19.8
12AF4[ ]MZ	12	1/4	41.2	19.1	5.5	24.5
12AF8[ ]MZ	12	1/2	46.7	27.0	7.0	24.5
14AF8[ ]MZ	14	1/2	46.7	27.0	7.0	24.5
16AF8[ ]MZ	16	1/2	49.5	27.0	7.0	27.3
18AF8[ ]MZ	18	1/2	56.1	27.0	7.0	27.9
22AF8[ ]MZ	22	1/2	57.9	27.0	7.0	29.7
25AF8[ ]MZ	25	1/2	63.7	27.0	7.0	35.5

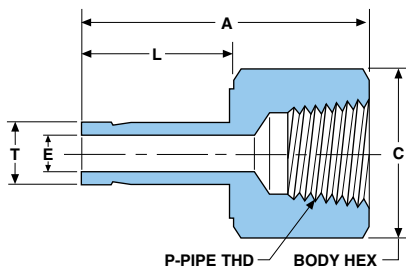
RG female thread ends require a gasket inserted into the bottom of the port. The male end, when assembled, exerts pressure on the gasket, creating a seal.

### Female Adapter: AF/EC

connects **fractional** port to male RT tapered threads



Metric fitting shown



Part Number*	T	S	Dimensions — inches			
	Tube O.D.	Thd. Size	A	Hex Flat	E	L
4AF2[ ]EC	1/4	1/8	1.22	9/16	.19	.69
4AF4[ ]EC	1/4	1/4	1.41	3/4	.19	.69
6AF6[ ]EC	3/8	3/8	1.53	7/8	.28	.78
8AF8[ ]EC	1/2	1/2	1.91	1 1/16	.39	.97

### Female Adapter: AF/MC

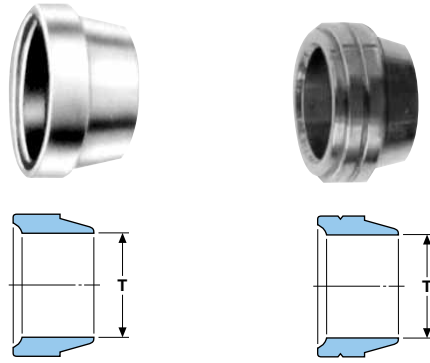
connects **metric** port to male RT tapered threads

Part Number*	T	P	Dimensions — mm			
	Tube O.D.	Pipe Thd.	A	Hex Flat	E	L
3AF2[ ]MC	3	1/8	28.8	14.3	2.1	15.9
3AF4[ ]MC	3	1/4	33.3	19.1	2.1	15.9
6AF2[ ]MC	6	1/8	30.9	14.3	4.4	17.3
6AF4[ ]MC	6	1/4	35.7	19.1	4.4	17.3
6AF6[ ]MC	6	3/8	36.5	22.2	4.4	17.3
6AF8[ ]MC	6	1/2	41.3	27.0	4.4	17.3
8AF2[ ]MC	8	1/8	32.8	14.3	6.2	19.1
8AF4[ ]MC	8	1/4	37.5	19.1	6.2	19.1
8AF6[ ]MC	8	3/8	40.4	22.2	6.2	19.1
8AF8[ ]MC	8	1/2	43.9	27.0	6.2	19.1
10AF2[ ]MC	10	1/8	33.3	14.3	7.5	19.8
10AF4[ ]MC	10	1/4	38.1	19.1	7.5	19.8
10AF6[ ]MC	10	3/8	38.9	22.2	7.5	19.8
10AF8[ ]MC	10	1/2	43.7	27.0	7.5	19.8
12AF4[ ]MC	12	1/4	42.9	19.1	9.1	24.5
12AF6[ ]MC	12	3/8	44.7	22.2	9.1	24.5
12AF8[ ]MC	12	1/2	48.4	27.0	9.1	24.5
12AF12[ ]MC	12	3/4	53.3	31.8	9.1	24.5

\* [ ] see page 6 for material specifications.

### Front Ferrule: FF (Fractional)

Part Number*	T Tube O.D.—inches
1FF[ ]	1/16
2FF[ ]	1/8
3FF[ ]	3/16
4FF[ ]	1/4
6FF[ ]	3/8
8FF[ ]	1/2
10FF[ ]	5/8
12FF[ ]	3/4
14FF[ ]	7/8
16FF[ ]	1
20FF[ ]	1 1/4
24FF[ ]	1 1/2
32FF[ ]	2



### Front Ferrule FF/MM (Metric)

Part Number*	T Tube O.D.—mm
3FF[ ]MM	3
4FF[ ]MM	4
6FF[ ]MM	6
8FF[ ]MM	8
10FF[ ]MM	10
12FF[ ]MM	12
14FF[ ]MM	14
15FF[ ]MM	15
16FF[ ]MM	16
18FF[ ]MM	18
20FF[ ]MM	20
22FF[ ]MM	22
25FF[ ]MM	25
30FF[ ]MM	30
32FF[ ]MM	32
38FF[ ]MM	38

### Rear Ferrule: FR (Fractional)

Part Number*	T Tube O.D.—inches
1FR[ ]	1/16
2FR[ ]	1/8
3FR[ ]	3/16
4FR[ ]	1/4
6FR[ ]	3/8
8FR[ ]	1/2
10FR[ ]	5/8
12FR[ ]	3/4
14FR[ ]	7/8
16FR[ ]	1
20FR[ ]	1 1/4
24FR[ ]	1 1/2
32FR[ ]	2



### Rear Ferrule FR/MM (Metric)

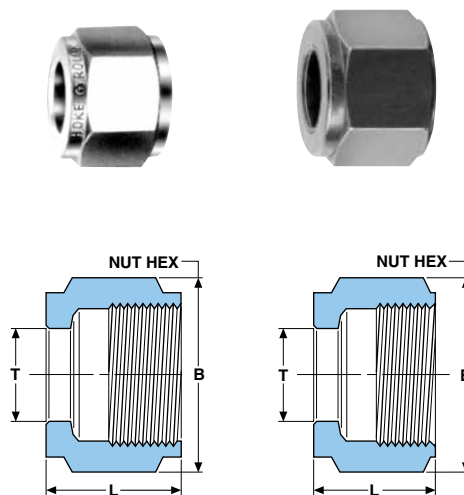
Part Number*	T Tube O.D.—mm
3FR[ ]MM	3
4FR[ ]MM	4
6FR[ ]MM	6
8FR[ ]MM	8
10FR[ ]MM	10
12FR[ ]MM	12
14FR[ ]MM	14
15FR[ ]MM	15
16FR[ ]MM	16
18FR[ ]MM	18
20FR[ ]MM	20
22FR[ ]MM	22
25FR[ ]MM	25
30FR[ ]MM	30
32FR[ ]MM	32
38FR[ ]MM	38

Nylon front and rear ferrules are available in both fractional and metric.

Note: Stainless steel front ferrules larger than 1" and 25mm are PFA coated.

### Nut: N (Fractional)

Part Number*	T Tube O.D.	Dimensions—inches	
		B	L
1N[ ]	1/16	5/16	0.33
2N[ ]	1/8	3/16	0.52
3N[ ]	3/16	1/2	0.52
4N[ ]	1/4	9/16	0.53
6N[ ]	3/8	11/16	0.59
8N[ ]	1/2	7/8	0.70
10N[ ]	5/8	1	0.70
12N[ ]	3/4	1 1/8	0.72
14N[ ]	7/8	1 1/4	0.78
16N[ ]	1	1 1/2	0.78
20N[ ]	1 1/4	1 7/8	1.25
24N[ ]	1 1/2	2 1/4	1.50
32N[ ]	2	3	2.06



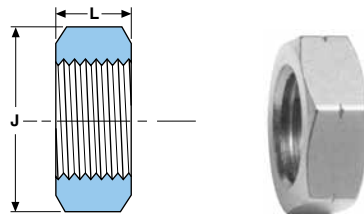
### Nut N/MM (Metric)

Part Number*	T Tube O.D.	Dimensions—mm	
		B	L
3N[ ]MM	3	11.1	13.1
4N[ ]MM	4	12.7	13.3
6N[ ]MM	6	14.3	13.4
8N[ ]MM	8	15.9	14.1
10N[ ]MM	10	19.1	15.0
12N[ ]MM	12	22.2	17.9
14N[ ]MM	14	23.8	16.8
15N[ ]MM	15	23.8	16.8
16N[ ]MM	16	25.4	17.8
18N[ ]MM	18	28.6	18.4
20N[ ]MM	20	31.8	20.0
22N[ ]MM	22	31.8	20.0
25N[ ]MM	25	38.1	21.3
30N[ ]MM	30	50.8	32.8
32N[ ]MM	32	50.8	34.4
38N[ ]MM	38	60.3	40.6

\* [ ] see page 6 for material specifications.

## Bulkhead Nut: BN (Fractional)

Part Number*	Dimensions—inches	
	L	J
1BN[ ]	1/8	3/8
2BN[ ]	7/32	1/2
3BN[ ]	7/32	9/16
4BN[ ]	1/4	5/8
6BN[ ]	17/64	3/4
8BN[ ]	5/16	15/16
10BN[ ]	23/64	1 1/16
12BN[ ]	13/32	1 3/16
14BN[ ]	13/32	1 5/16
16BN[ ]	13/32	1 9/16
24BN[ ]	1/2	2 1/4
32BN[ ]	1/2	2 3/4

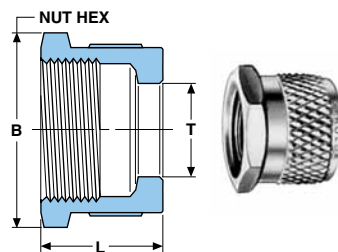


## Bulkhead Nut: BN/MM (Metric)

Part Number*	Fitting Size mm	Dimensions—mm	
		L	J
2BN[ ]	3	5.5	12.7
3BN[ ]	4	5.5	14.3
4BN[ ]	6	6.4	15.9
8BN[ ]MM	8	6.4	17.5
10BN[ ]MM	10	6.7	19.1
8BN[ ]	12	7.9	23.8
14BN[ ]MM	14 or 15	7.9	23.8
10BN[ ]	16	9.1	27.0
12BN[ ]	18	10.3	30.2
14BN[ ]	20 or 22	10.3	33.3
16BN[ ]	25	10.3	39.7

## Knurled Nut: KN (Fractional)

Part Number*	T Tube O.D.	Dimensions—inches	
		B	L
1KN[ ]	1/16	5/16	0.36
2KN[ ]	1/8	7/16	0.52
3KN[ ]	3/16	1/2	0.52
4KN[ ]	1/4	9/16	0.53
6KN[ ]	3/8	1 1/16	0.59
8KN[ ]	1/2	7/8	0.70
10KN[ ]	5/8	1	0.70
12KN[ ]	3/4	1 1/8	0.72
14KN[ ]	7/8	1 1/4	0.78
16KN[ ]	1	1 1/2	0.78



HOKE **GYROLOK**® Fittings are available with knurled nuts and nylon ferrules for use with polyethylene tubing. Hand-tightening allows for quick, easy assembly and disassembly, while providing a leak-tight seal, ideally suited for laboratory hookups. Use such fittings with glass and other hard wall tubing materials.

To order, simply add KNN to the basic part number.

**Example:** 4CM4 with a knurled nut and nylon ferrules would be 4CM4 KNN.

## Safety Changer Nut & Ferrule Sets: SCNF



Each SCNF contains 5 nut and ferrule sets. A nut and ferrule set consists of 1 nut, 1 front ferrule and 1 rear ferrule.

Provides a safe, easy, correct way to reuse existing fittings and valves with new HOKE **GYROLOK**® components. Color coding differentiates metric and fractional parts and materials.

### Fractional

Part Number*	Nut & Ferrule Sets/Changer	Tube O.D.—inches
1SCNF[ ]	5	1/16
2SCNF[ ]	5	1/8
3SCNF[ ]	5	3/16
4SCNF[ ]	5	1/4
6SCNF[ ]	5	3/8
8SCNF[ ]	5	1/2
10SCNF[ ]	5	5/8
12SCNF[ ]	5	3/4
16SCNF[ ]	5	1

### Metric

Part Number*	Nut & Ferrule Sets/Changer	Tube O.D.—mm
3SCNF[ ]MM	5	3
6SCNF[ ]MM	5	6
8SCNF[ ]MM	5	8
10SCNF[ ]MM	5	10
12SCNF[ ]MM	5	12



Color Coded Package:

- Green: Fractional Brass, Fractional 316 Stainless Steel
- Red: Fractional Monel
- Blue: Metric

### How to Order

Add designated material to part number. For example:

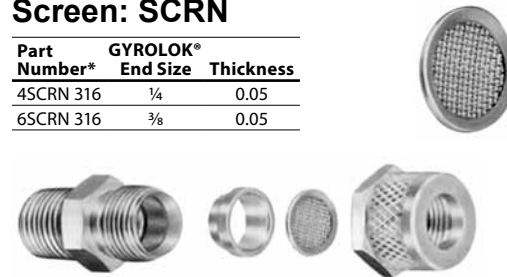
- Brass = BR
- 316 Stainless Steel = 316
- Monel = M

**Example:** 2SCNF 316 (5 nut and ferrule sets for 1/8" tubing in 316 Stainless Steel.)

\* [ ] see page 6 for material specifications.

## Screen: SCRN

Part Number*	GYROLOK® End Size	Thickness
4SCRN 316	1/4	0.05
6SCRN 316	3/8	0.05



Use to prevent insects from entering open vent lines.

### Usage Instructions:

1. Substitute screen for rear ferrule in an open HOKE **GYROLOK**®-ended line. (No tubing connected.)
2. Finger-tighten nut.

## Safety Changer Ferrule Sets: SCF



Each SCF contains 10 ferrule sets as noted. A ferrule set consists of 1 front ferrule and 1 rear ferrule.

### Fractional

Part Number*	Nut & Ferrule Sets/Changer	Tube O.D.—inches
1SCF[ ]	10	1/16
2SCF[ ]	10	1/8
3SCF[ ]	10	3/16
4SCF[ ]	10	1/4
6SCF[ ]	10	3/8
8SCF[ ]	10	1/2
10SCF[ ]	10	5/8
12SCF[ ]	10	3/4
16SCF[ ]	10	1

### Metric

Part Number*	Nut & Ferrule Sets/Changer	Tube O.D.—mm
3SCF[ ]MM	10	3
6SCF[ ]MM	10	6
8SCF[ ]MM	10	8
10SCF[ ]MM	10	10
12SCF[ ]MM	10	12

# Tube Inserts

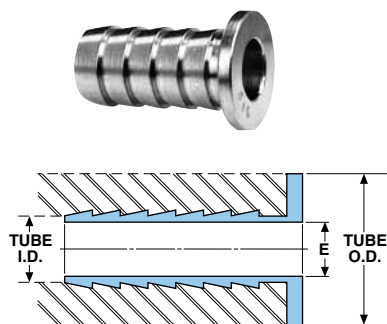
HOKE **GYROLOK**® tube fittings may be used with various types of plastic tube material without any special preparation. Use tube inserts to support soft types of tubing, such as Tygon or polyvinyl chloride, prior to insertion into a HOKE **GYROLOK**® end. See chart at lower right for recommendations.

### Usage Instructions

1. Fully insert Tube Insert into plastic tubing, where appropriate.
2. If using standard nut, follow standard HOKE **GYROLOK**® assembly instructions, page 53 (Hand-tighten, then tighten 1¼ turns with wrench.)
3. For finger-tight assembly, standard Brass fittings are available with knurled nuts and nylon ferrules.

### Example:

4	TI	2	316
Tube O.D. in sixteenths of an inch — 1/4"	Type Fitting (Tube Insert)	Tube I.D. in sixteenths of an inch — 1/8" (Except .170 I.D.)	Material Brass = BR 316SS = 316



### Tube Insert: TI (Fractional)

Part Number*	Tube O.D.	Pipe Size	Dimensions — inches E
3T12 [ ]	3/16	1/8	.09
4T12 [ ]	1/4	1/8	.09
4T1.170 [ ]	1/4	.170	.11
4T13 [ ]	1/4	3/16	.13
6T13 [ ]	3/8	3/16	.13
6T14 [ ]	3/8	1/4	.19
8T14 [ ]	1/2	1/4	.19
8T16 [ ]	1/2	3/8	.28
10T16 [ ]	5/8	3/8	.28
10T18 [ ]	5/8	1/2	.42
12T18 [ ]	3/4	1/2	.42
12T110 [ ]	3/4	5/8	.50
14T110 [ ]	7/8	5/8	.50
14T112 [ ]	7/8	3/4	.66
16T112 [ ]	1	3/4	.66
16T114 [ ]	1	7/8	.72

### Tube Insert: TI/MM (Metric)

Part Number*	T Tube O.D.	Tube I.D.	Dimensions — mm E
6T14 [ ]MM	6	4	2.2
8T16 [ ]MM	8	6	4.3
10T18 [ ]MM	10	8	6.3
12T110 [ ]MM	12	10	7.9

### Tube Insert: TI/ME (Metric)

Part Number*	T Tube O.D.	Tube I.D.	Dimensions — mm E
8T14 [ ]ME	8	1/4	4.7



HOKE **GYROLOK**® Used With Plastic Tubing and Tube Insert

Tubing Material	Front Ferrule	Rear Ferrule	Tube Insert Usage
Polyethylene	Metal	Metal	Not normally required
	Nylon	Nylon	
Nylon	Metal	Metal	Not normally required
	Nylon	Nylon	
PTFE	Metal	Metal	Not normally required
	PTFE	PTFE or Metal	
Rigid PVC	Metal	Metal	None
	PTFE*	PTFE*	
Soft Polyvinyl Chloride or Tygon	Metal	Metal	Recommended
	Nylon	Nylon	

\* Limited gripping, metal provides tighter grip for higher pressures.

\* [ ] see page 6 for material specifications.

## HOKE GYROLOK® Calibration Fittings



HOKE **GYROLOK**® Calibration Fittings save time and money by reducing the time required to calibrate differential pressure transmitters. HOKE's calibration fittings, constructed of 316 Stainless Steel, combine a straight thread and conical metal-to-metal sealing surface on one end with a 1/4" **GYROLOK**® tube fitting on the other. This design allows the technician to easily calibrate the transmitter – in place – without removing the pipe plug/bleed port tap assemblies. No TFE tape is required. **GYROLOK**®'s exclusive Controlled Ferrule Drive increases value – extending cycle life.

### Features

Straight Thread/Metal-to-Metal Sealing:

Controlled Ferrule Drive:

Butt Seal:

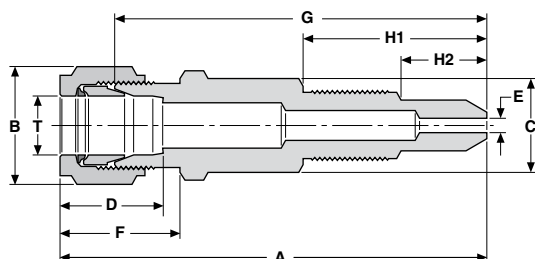
Sizing Angle:

Nut and Ferrule Safety Changer:

### Benefits

- Ease of installation
- Greatly extends remake life
- Protects tubing from oversteering
- Maximizes seal integrity and user safety
- Reduces tube sticking
- Safe, simple component replacement

### Dimensions (Fractional)

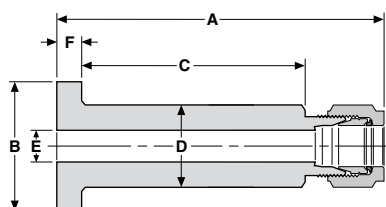


Part Number	T		Dimensions – inches									
	Tube O.D.	Straight Thread	A	B	C	D	E	F	G	H1	H2	
CM005 [ ]	1/4	1/4-28	1 23/32	9/16	1/2	41/64	1/16	49/64	1 13/32	25/32	27/64	
CM009 [ ]	1/4	5/16-24	2 11/32	9/16	1/2	41/64	1/16	49/64	2 1/32	1	25/64	

CM005 – For use with Honeywell transmitters

CM009 – For use with Rosemount or Foxboro transmitters

### Lapped Flange Connector



### Lapped Flange Connector: CLF (Fractional)

Part Number	T		Dimensions – inches							Finish
	Tube O.D.	Flange Seal	A	B	C	D	E	F		
4CLFA [ ]	1/4	A	3.33	1.38	2.28	.88	.19	.25	3.2 – 6.3 Micrometer (Ra)	
4CLFB [ ]	1/4	B	3.33	1.38	2.28	.88	.19	.25	6.3 – 12.5 Micrometer (Ra)	
6CLFA [ ]	3/8	A	3.34	1.38	2.28	.88	.30	.25	3.2 – 6.3 Micrometer (Ra)	
6CLFB [ ]	3/8	B	3.34	1.38	2.28	.88	.30	.25	6.3 – 12.5 Micrometer (Ra)	
8CLFA [ ]	1/2	A	3.47	1.38	2.28	.88	.42	.25	3.2 – 6.3 Micrometer (Ra)	
8CLFB [ ]	1/2	B	3.47	1.38	2.28	.88	.42	.25	6.3 – 12.5 Micrometer (Ra)	

### Lapped Flange Connector: CLF/MM (Metric)

Part Number	T		Dimensions – mm							Finish
	Tube O.D.	Flange Seal	A	B	C	D	E	F		
10CLFA [ ]MM	10	A	84.1	34.9	57.9	22.2	7.1	6.4	3.2–6.3 Micrometer (Ra)	
10CLFB [ ]MM	10	B	84.1	34.9	57.9	22.2	7.1	6.4	6.3–12.5 Micrometer (Ra)	

Flange Seal A

Flange Seal B



Smooth Serrated / Concentric

The Lapped Flange Connector is used to allow safe and easy connections between process lines and instruments. The basic, one-piece unit consists of a HOKE **GYROLOK**® tube connection end and a 1/2" lap joint pipe flange. The flange end is dimensioned to meet "ANSI 2500" flange specifications. Available in "Smooth" or "Serrated/Concentric" seal faces, and in 316 Stainless Steel or Monel.

\* [ ] see page 6 for material specifications.

# HOKE Dielectric Tube Fittings



The HOKE **GYROLOK**® Dielectric Tube Fittings are for use in applications where electrical current flowing through a pipe or tube line must be interrupted to protect vital instrumentation and metering equipment.

## Technical Data

Body Construction Materials:	• 316 Stainless Steel
Insulator:	• Molded Thermoplastic
O-ring Material:	• 90 Durometer Viton
Back-up Washer:	• Virgin TFE

## Design

The Dielectric Tube Fitting must perform three primary functions:

1. Electrical insulation
2. Reliable fluid containment
3. Appropriate flow for line size

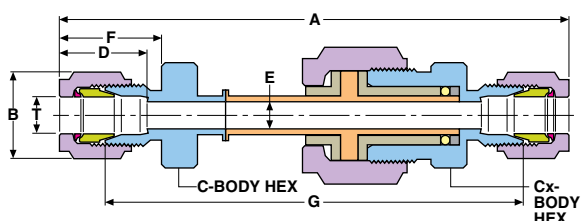
In the HOKE design, the insulation function is performed by thermoplastic insulators which provide performance unequaled by any similar product.

A Viton O-ring and TFE back up ring provide the containment function within the fitting. **GYROLOK**®'s 2-ferrule system provides sealing with the impulse line tubing.

Appropriate flow for line size is achieved by providing the appropriate inside diameter for tubing size. See "E" dimensions in Dimensional Table.

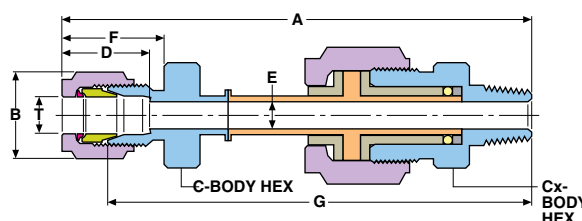
**WARNING: A "NO WRENCHING" label is placed on the hex of the nut in the insulation sections. Do not disconnect at this point. Instructions are provided with every HOKE Dielectric fitting.**

## Dielectric Unions: DU

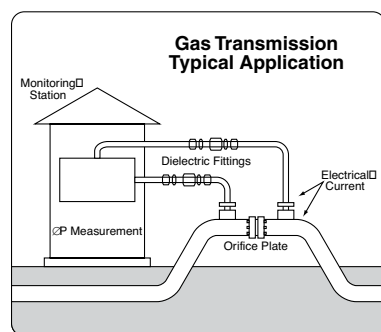


Part No.	T Tube O.D.	Dimensions — inches							
		A	B	C Hex Flat	Cx Hex Flat	D	E	F	G
4DU-316	1/4	3.78	9/16	1/2	11/16	.64	.19	.77	3.12
6DU-316	3/8	3.92	11/16	5/8	13/16	.72	.28	.83	3.23
8DU-316	1/2	4.15	7/8	13/16	15/16	.97	.42	.92	3.21

## Dielectric Male Connectors: DCM



Part No.	T Tube O.D.	Dimensions — inches							
		A	B	C Hex Flat	Cx Hex Flat	D	E	F	G
6DCM4-316	3/8	3.66	11/16	5/8	13/16	.72	.28	.83	3.32



## Application

Commonly used in the Natural Gas Transmission industry, the Dielectric Fitting will prevent current flow resulting from Impressed Current Cathodic Protection Systems, static electricity or even lightning strikes, from reaching sensitive monitoring station equipment.

Impressed Current Cathodic Protection Systems involve the application of a low voltage, low amperage direct current to a pipeline and eventual transfer of corrosive effects to a typically underground anode bed.

If the current flow is not interrupted before reaching the monitoring station critical equipment could be damaged or rendered inaccurate.

By installing HOKE's **GYROLOK**® Dielectric Tube Fitting on impulse lines between the pipeline and the monitoring station, current flow is interrupted while full fluid flow is permitted.



## HOKE Chromatography Fittings



HOKE **GYROLOK**® tube fittings for use in gas or liquid chromatography applications are available in a variety of user-required configurations. HOKE's Chromatography Fittings feature low dead volumes, male nut designs, as well as configurations utilizing either press-fit or drop-in frits. For user convenience, both frit versions are available in a number of micron sizes. By combining the needs of the Chromatography Fitting with key **GYROLOK**® features, such as controlled ferrule drive, the HOKE Chromatography Fitting offers capabilities and performance that are unmatched in the industry.

### Pressure Ratings

HOKE **GYROLOK**® Chromatography fittings are rated for working pressures higher than the tubing recommended for use. Refer to HOKE's Tubing Data Charts for specific information.

### Temperature Ratings

316 Stainless Steel: -325° F to +800° F (-200° C to +425° C)

Note: Intermittent use to 1200° F is possible, however prolonged exposure to temperatures over 800° F is not recommended.

### Features

Low Dead Volume:

Press-fit or Drop-in Frits:

Conical Diffusion Angle:

Male Nut Configuration:

Fritless Configurations:

Controlled Ferrule Drive:

Interchangeability:

### Benefits

- Accurate analysis and measurement
- Filter elements can be ordered factory installed (press-fit) or for field installation (drop-in)
- 4 micron sizes are offered as standard, other sizes can be provided
- Perform final filtering function for low volume fluids
- Press-fit frit design reduces internal volume
- Assures fluid contact over a greater surface, extending frit life while reducing unfiltered volume
- Reduced internal volume
- For use with G.C. columns or L.C.'s with screens
- Long product life with outstanding remakeability
- Fittings are interchangeable with those of certain other manufacturers (consult factory)

## How to Order—Fittings

2	F	U	M	P	1	316
Tube O.D. in 1/16 of an inch; 2=2/16"=1/8"	Nut Type M = male F = female size 2 nut is female	Fitting Type U = union RU = reducing union CM = male connector	Nut Type M = male F = female only used if different nut type is used	Press-Fit Frit size P = .5 micron R = 2 micron T = 5 micron V = 10 micron	Tube Size in 1/16's of an inch	Material 316 stainless steel

## Dimension Tables

### Drop-In Frit

Part No.	Column O.D.
4FRIT [ * ] - 316	1/4
6FRIT [ * ] - 316	3/8
8FRIT [ * ] - 316	1/2
16FRIT [ * ] - 316	1

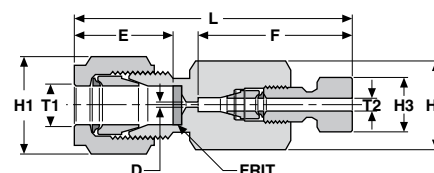
\* Frit designator in microns: E=2.0, G=5.0, I=10.  
Assign appropriate letter code for desired size.

### FOR YOUR SAFETY

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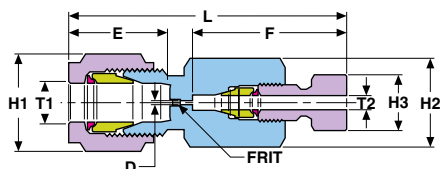
## Column End Fitting (for use with drop-in frit)

Part No.	T1 x T2 Tube Sizes	Dimensions — inches						
		L	D	H1	H2	H3	E Dim	F Dim
		Length	Dia.	Hex Size	Hex Size	Hex Size		
4FUM1-316	1/4 x 1/16	1.57	0.020	9/16	1/2	1/4	41/64	51/64
6FUM1-316	3/8 x 1/16	1.65	0.020	11/16	5/8	1/4	23/32	51/64
8FUM1-316	1/2 x 1/16	1.93	0.030	7/8	13/16	1/4	31/32	51/64
16FUM1-316	1 x 1/16	2.30	0.030	1 1/2	1 3/8	1/4	1 5/16	51/64

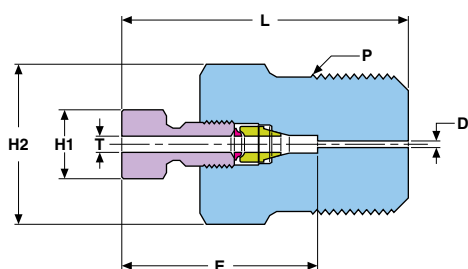
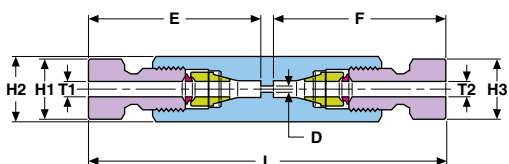
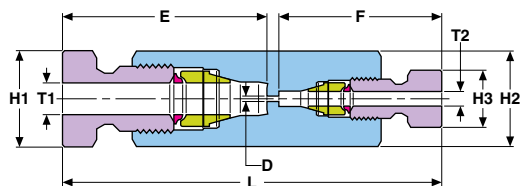
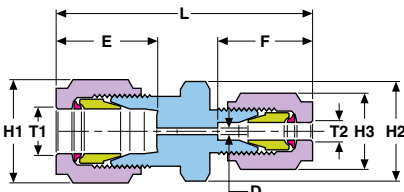
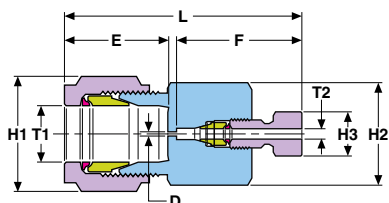
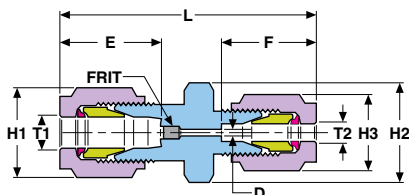


\* [ ] see page 6 for material specifications.

### Column End Fitting (with press-fit frit)



### Union (with press-fit frit)



Part No.	T1 x T2 Tube Sizes	L Length	D Dia.	Dimensions — inches				
				H1 Hex Size	H2 Hex Size	H3 Hex Size	E Dim	F Dim
2FUM*1-316	1/8 X 1/16	1.50	0.013	7/16	7/16	1/4	9/16	51/64
4FUM*1-316	1/4 X 1/16	1.57	0.013	9/16	1/2	1/4	41/64	51/64
6FUM*1-316	3/8 X 1/16	1.64	0.013	11/16	5/8	1/4	23/32	51/64

\*Frit designator in microns: P=0.5, R=2.0, T=5.0, V=10. Assign letter code to complete part number.

Part No.	T1 x T2 Tube Sizes	L Length	D Dia.	Dimensions — inches				
				H1 Hex Size	H2 Hex Size	H3 Hex Size	E Dim	F Dim
2FU*1-316	1/8 X 1/16	1.36	0.020	7/16	7/16	5/16	9/16	13/32
4FU*1-316	1/4 X 1/16	1.47	0.020	9/16	1/2	5/16	41/64	13/32
6FU*1-316	3/8 X 1/16	1.56	0.020	11/16	5/8	5/16	23/32	13/32

\*Frit designator in microns: P=0.5, R=2.0, T=5.0, V=10. Assign letter code to complete part number.

### Column End Fitting

Part No.	T1 x T2 Tube Sizes	L Length	D Dia.	Dimensions — inches				
				H1 Hex Size	H2 Hex Size	H3 Hex Size	E Dim	F Dim
2FRUM1-316	1/8 X 1/16	1.41	0.013	7/16	7/16	1/4	9/16	51/64
4FRUM1-316	1/4 X 1/16	1.48	0.013	9/16	1/2	1/4	41/64	51/64
6FRUM1-316	3/8 X 1/16	1.56	0.013	11/16	5/8	1/4	23/32	51/64

### Reducing Union

Part No.	T1 x T2 Tube Sizes	L Length	D Dia.	Dimensions — inches				
				H1 Hex Size	H2 Hex Size	H3 Hex Size	E Dim	F Dim
2FRU1-316	1/8 X 1/16	1.33	0.020	7/16	7/16	5/16	9/16	13/32
4FRU1-316	1/4 X 1/16	1.47	0.020	9/16	1/2	5/16	41/64	13/32
6FRU1-316	3/8 X 1/16	1.56	0.020	11/16	5/8	5/16	23/32	13/32

### Reducing Union (male nut)

Part No.	T1 x T2 Tube Sizes	L Length	D Dia.	Dimensions — inches				
				H1 Hex Size	H2 Hex Size	H3 Hex Size	E Dim	F Dim
2MRU1-316	1/8 X 1/16	1.91	0.013	3/8	7/16	1/4	1 1/16	51/64

### Union (male nut)

Part No.	T1 x T2 Tube Sizes	L Length	D Dia.	Dimensions — inches				
				H1 Hex Size	H2 Hex Size	H3 Hex Size	E Dim	F Dim
1MU-316	1/16 X 1/16	1.84	0.013	1/4	5/16	1/4	51/64	51/64
2MU-316	1/8 X 1/8	2.18	0.052	3/8	7/16	3/8	1 1/16	1 1/16

### Male Connector (male nut)

Part No.	T Tube Size	P Pipe Size	L Length	D Dia.	Dimensions — inches		
					H1 Hex Size	H2 Hex Size	E Dim
1MCM1-316	1/16	1/16 NPT	0.880	0.013	1/4	5/16	51/64
1MCM2-316	1/16	1/8 NPT	0.940	0.013	1/4	7/16	51/64
1MCM4-316	1/16	1/4 NPT	1.160	0.013	1/4	9/16	51/64

Note: All dimensions are for reference only.

## Gyrogage



Today's safety conscious users are paying greater attention to tube fitting performance. User studies indicate that, while superior fittings will greatly improve performance, problems still occur. Why? Data shows that the leading cause of performance loss is the incorrect assembly of the tubing and fitting. They found, for example, that:

- Difficult-to-reach fitting nuts were not always tightened.
- Improper ferrule set occurred because burrs, or too short a tube length after a bend, prevented tubing from being fully inserted
- Improper make-up was caused by missing ferrules, because a ferrule borrowed from a fitting in inventory was never replaced

**HOKE has addressed all of these concerns with the HOKE Gyrogage!**

### Features

Missing ferrule indicator:

Scribing tool:

Usable by both assembler and post assembly inspector:

Color-coded gages:

Size markings:

Single tool per size:

Choice of marking methods:

### Benefits

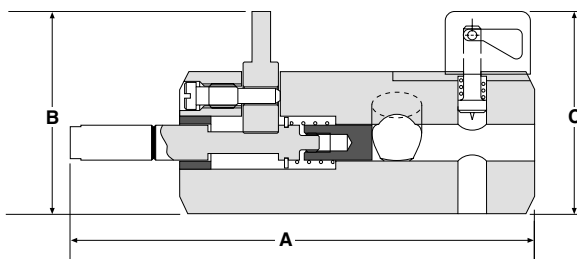
- Maximizes system safety by confirming that all components are in place. **HOKE exclusive**
- Assures proper assembly by marking tubing to show that it has been properly inserted into fitting, and that fitting has been properly tightened.
- Redundant method of verification.
- Simplifies selection of appropriate system gage: metric (blue) or fractional (green). **HOKE exclusive**
- Simplifies selection of appropriate size gage.
- Eliminates need for extra tools; use one tool for installation and inspection, even for hard-to-reach assemblies.
- Adds flexibility to assembly and inspection with choice of marking systems: built-in scriber or separate ink marker\*. **HOKE exclusive**

## How to Order

**4 GG**  
**TUBE SIZE** \_\_\_\_\_  
 Tube O.D. in 16<sup>ths</sup>  
 of an inch  
**TYPE OF PRODUCT**  
 (HOKE Gyrogage)

**6 GG / MM**  
**TUBE SIZE** \_\_\_\_\_  
 Tube O.D. in  
 MM. (6mm)  
**METRIC DESIGNATION**  
 (millimeters)  
**TYPE OF PRODUCT**  
 (HOKE Gyrogage)

## Dimensions



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Part Number	Tube Size	A	B	C	Options: Replacement Scribers*
<b>Fractional Sizes</b>					
<b>Inch</b>					
1GG	1/16	3 3/64	1 11/16	1	SPGGK1
2GG	1/8	3 1/64	1 11/16	1	SPGGK2
3GG	3/16	3 1/64	1 11/16	1	SPGGK3
4GG	1/4	3 17/64	1 11/16	1	SPGGK4
6GG	3/8	3 15/32	1 13/16	1 1/8	SPGGK4
8GG	1/2	4 3/64	1 31/32	1 1/4	SPGGK4
10GG	5/8	4 35/64	2 5/8	1 5/8	SPGGK5
12GG	3/4	4 47/64	2 11/16	1 3/4	SPGGK5
14GG	7/8	4 63/64	2 13/16	1 7/8	SPGGK5
16GG	1	5 9/16	3 1/32	2	SPGGK5
<b>Metric Sizes</b>					
<b>mm</b>					
3GG/MM	3	3 13/64	1 11/16	1	SPGGK2
6GG/MM	6	3 1/4	1 11/16	1	SPGGK4
8GG/MM	8	3 11/32	1 3/4	1 1/16	SPGGK4
10GG/MM	10	3 1/2	1 13/16	1 1/8	SPGGK4
12GG/MM	12	4 7/64	1 31/32	1 1/4	SPGGK4
14GG/MM	14	4 3/16	2 15/32	1 9/16	SPGGK5
16GG/MM	16	4 9/16	2 17/32	1 5/8	SPGGK5
18GG/MM	18	4 23/32	2 5/8	1 11/16	SPGGK5
20GG/MM	20	5 1/8	2 3/4	1 13/16	SPGGK5
22GG/MM	22	4 61/64	2 13/16	1 7/8	SPGGK5
25GG/MM	25	5 35/64	3 1/32	2	SPGGK5

\* Gyrogage scribers can be quickly and easily replaced using the referenced kit numbers.

## GYROLOK® Marking Tool

Tube fitting users have long recognized that proper tube and tube fitting system function requires good tubing preparation followed by the use of correct installation procedures. Improper ferrule set in any flareless tube and fitting system may be the result of burrs created during the tube cutting process, improper tube insertion into the fitting, or inadequate tightening of the fitting nut. In order to maximize tube and fitting system performance and safety, HOKE offers several tool options combined with detailed installer training. The **GYROLOK®** Marking Tool provides the installer with an economical means of ensuring both proper tubing insertion into the fitting and adequate nut tightening.



Standard GMT



Three-In-One GMT  
(468 GMT and 61012 GMT-MM)

### Usage Instructions

1. Squarely cut tubing, preferably with a tube cutter, and then deburr both inside and outside diameters as necessary.
2. Firmly insert tubing into the tool as far as possible.
3. Mark the tubing, as shown, with a Sharpie Ultrafine Point model 37001 marker. Take care to position perpendicular to the tool as shown for correct marking position.
4. Firmly insert the marked tubing into the **GYROLOK®** fitting to which it will be assembled. Finger-tighten the nut if below 12MM, tube tight if 12MM and above. The mark should NOT be visible at this point. If not visible, continue to step 5. If any part of the mark is visible above the **GYROLOK®** nut after finger-tightening below 12MM, tube tight if 12MM and above, the tubing is either not properly seated within the fitting or a ferrule is missing. Disassemble and determine cause.
5. If the mark is not visible after finger-tightening, continue by following appropriate **GYROLOK®** assembly instructions for tubing O.D. and wall thickness.

### Part Numbers

SIZE	PARTNUMBER	SIZE	PART NUMBER
1/8"	2GMT	6MM	6GMTMM
1/4"	4GMT	8MM	8GMTMM
3/8"	6GMT	10MM	10GMTMM
1/2"	8GMT	12MM	12GMTMM
5/8"	10GMT	14MM	14GMTMM
3/4"	12GMT	15MM	15GMTMM
1"	16GMT	16MM	16GMTMM
1/4", 3/8", 1/2"	468GMT	18MM	18GMTMM
		20MM	20GMTMM
		22MM	22GMTMM
		25MM	25GMTMM
		6MM, 10MM, 12MM	61012GMT-MM

## Pre-setting Tool: PST

Used strictly for pre-assembling ferrules to tubing.

### Fractional

Part Number*	Tube O.D.	Length	Dimensions — inches Across Flats
1PST	1/16	2.25	3/8
2PST	1/8	1.94	11/16
3PST	3/16	2	1/2
4PST	1/4	1.94	11/16
6PST	3/8	1.97	11/16
8PST	1/2	2	7/8
12PST	3/4	2.50	1 1/8
16PST	1	2.50	1 1/2

### Metric

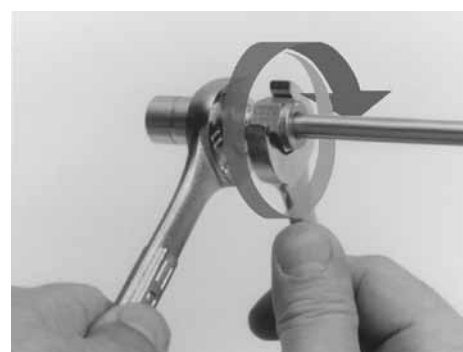
Part Number*	Tube O.D.	Length	Dimensions — mm Across Flats
3PSTMM	3	49.2	17.3
6PSTMM	6	49.0	17.3
8PSTMM	8	50.0	17.3
10PSTMM	10	50.8	17.3
12PSTMM	12	50.8	22.0
14PSTMM	14	50.8	22.0
16PSTMM	16	63.5	28.4
18PSTMM	18	63.5	28.4
20PSTMM	20	63.5	28.4
22PSTMM	22	63.5	37.9
25PSTMM	25	63.5	37.9

### Usage Instructions

1. Place PST in vise.
2. Loosely assemble nut and ferrules to PSI. Use HOKE **GYROLOK®** Safety Changer Nut & Ferrule Sets.
3. Follow standard HOKE **GYROLOK®** assembly instructions to set ferrules onto tubing, see page 53.
4. Loosen nut and remove tubing with pre-set ferrules and nut.
5. With pre-set ferrules and nut in permanent location, reassemble tubing by following HOKE **GYROLOK®** reassembly instructions on page 53.

Note: Threads of pre-setting tools should be lubricated the very first time and relubricated every tenth time thereafter.

\* [ ] see page 6 for material specifications.



## Leak Detective Products



HOKE's Leak Detective products are used to detect leaks in pressurized gas systems. Use the Leak Detective to locate fugitive gas emissions in compressed air, oxygen, helium, hydrogen, nitrogen, natural gas, acetylene, and propane systems.

The Leak Detective is manufactured to meet specification MIL-L-25567D and is available in two types. Type 1 is for regular temperature applications 27° F to 200° F (-3° C to 95° C) while Type 2 is for colder application from -65° F to 200° F (-55° C to 95° C). The Leak Detective is packaged as standard in 8 ounce (230 ml) bottles or 1 gallon (4 liter) containers. A tracer tube is provided with each small bottle. 5 gallon containers and 55 gallon drums can also be provided upon request.



### Benefits

- Safety:**
- Oxygen compatible and manufactured in accordance with MIL-L-25567D
  - Meets requirements of ASME Section V for composition and purity
- Certifications:**
- Material Safety Data Sheets (MSDS) available
- Helps eliminate fugitive emissions:**
- Verifies leak-tight systems
- Cleanliness:**
- Leaves virtually no residue

### Packaging

Standard	Options
8 ounce	2 ounce
1 gallon	5 gallon
230 ml	55 gallon drum
4 liter	

### Technical Data

#### Specification

- Complies with MIL-L-25567D

#### Operating Temperatures

- Type 1: 27° F to 200° F (-3° C to 95° C)
- Type 2: -65° F to 200° F (-55° C to 95° C)

### Usage Instructions

1. Extend 12" tracer tube
2. Direct solution
3. Squeeze bottle
4. Inspect system for foaming that indicates leakage

### Ordering Information

PARTNUMBER	TYPE	LABEL LANGUAGE	SIZE
1LDE8OZ	1	English	8 ounce
1LDE1G	1	English	1 gallon
2LDE8OZ	2	English	8 ounce
2LDE1G	2	English	1 gallon
1LDEF230	1	English/French	230 ml
1LDEF4L	1	English/French	4 liter
2LDEF230	2	English/French	230 ml
2LDEF4L	2	English/French	4 liter
1LDS230	1	Spanish	230 ml
1LDS4L	1	Spanish	4 liter
2LDS230	2	Spanish	230 ml
2LDS4L	2	Spanish	4 liter

## Hydraulic Pre-Setting Tool



Larger tube fittings often require more effort to assemble properly than can be consistently achieved using hand wrenches. HOKE offers a portable Hydraulic Pre-setting Tool to make the assembly of larger fittings:

- **Safer.** The Hydraulic Pre-setting Tool helps assure consistently correct assembly of larger fittings.
- **Simpler.** Interchangeable die sets allow easy conversion from one tube and fitting size to another.
- **More cost-efficient.** Using the Hydraulic Pre-setting Tool extends fitting life and reduces assembly time.

Using the portable Hydraulic Pre-setting Tool, the **GYROLOK®** nut and ferrule system is initially set onto the tubing. The pre-set fitting and tube assembly is then easily installed by following the **GYROLOK®** reassembly instructions.

### How to Order

#### HOKE's Hydraulic Pre-Setting Tool, Pump and Ram Assembly.

Carrying case is included. Carrying case has room for 6 die sets.

Order a 3HPST unit, which includes:

- 3HPST assembly (see above picture)
- Grey indicator nut (use for 5/8" (14mm) thru 2" (38 mm) fittings)
- Black indicator nut (use for 1/2" (12mm) fittings ONLY)
- Black Case
- Enerpac Pump
- Die-Fixing bolt
- 5mm Allen Wrench
- Adjusting wrenches

**Die Sets** - Consists of one die and one jig for an individual tube size.



**2DJS - 12 MM**

**TUBE SIZE**  
 Tube O.D. in 1/16"  
 Tube O.D. in mm (with "MM" suffix)

**METRIC DESIGNATION  
 (MILLIMETERS)**

### Features

- One basic pre-setting head for all sizes:
- Interchangeable die sets:
- 10,000 PSI hydraulic pump:
- Carrying case:

### Benefits

- Provides versatility and value by covering sizes from 1/2" through 2" and 12mm through 50mm.
- Allows easy conversion from one tube and fitting size to another.
- Provides the force necessary for consistent, fast, and simple fitting assembly.
- Rugged steel carrying case offers easy transportation as well as a single storage location for all tool components.

### How It Works



**GYROLOK®** nut and ferrule system components are assembled onto Hydraulic Pre-Setting Tool. Hand pump is operated until indicator arm releases.



Pre-set tube assembly is ready for installation per HOKE's published instructions.

#### FOR YOUR SAFETY

IT IS SOLELY THE RESPONSIBILITY OF THE SYSTEM DESIGNER AND USER TO SELECT PRODUCTS SUITABLE FOR THEIR SPECIFIC APPLICATION REQUIREMENTS AND TO ENSURE PROPER INSTALLATION, OPERATION AND MAINTENANCE OF THESE PRODUCTS. MATERIAL COMPATIBILITY, PRODUCT RATINGS AND APPLICATION DETAILS SHOULD BE CONSIDERED IN THE SELECTION. IMPROPER SELECTION OR USE OF PRODUCTS DESCRIBED HEREIN CAN CAUSE PERSONAL INJURY OR PROPERTY DAMAGE.

FRACTIONAL TUBE SIZE	PART NUMBER	METRIC TUBE SIZE	PART NUMBER
1/2"	2DJS-8	12 MM	2DJS-12MM
5/8"	2DJS-10	14 MM	2DJS-14MM
3/4"	2DJS-12	16 MM	2DJS-16MM
7/8"	2DJS-14	18 MM	2DJS-18MM
1"	2DJS-16	20 MM	2DJS-20MM
1-1/4"	2DJS-20	22 MM	2DJS-22MM
1-1/2"	2DJS-24	25 MM	2DJS-25MM
2"	2DJS-32	28 MM	2DJS-28MM
		30 MM	2DJS-30MM
		32 MM	2DJS-32MM
		38 MM	2DJS-38MM
		50 MM	2DJS-50MM

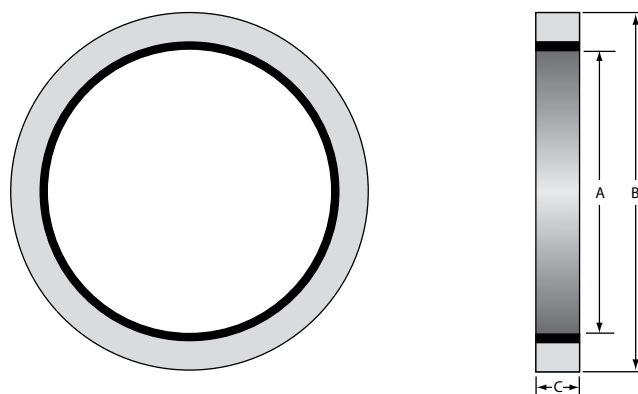
# HOKE GYROLOK® RS Bonded Seals

## RS Bonded Seals

RS bonded gaskets create a seal with DIN 3852, Type A (RS) parallel threads. Gasket outer rings are available in both 316 stainless steel and zinc plated carbon steel. The inner ring, bonded to the outer ring, consists of either Buna-N or fluorocarbon FKM. To order, specify pipe size, outer ring, and inner ring material.

Note: For use only with **GYROLOK®** RS fittings

BSP PIPE SIZE	DIMENSIONS (INCHES)		
	A	B	C
1/8"	0.41	0.63	0.08
1/4"	0.54	0.81	0.08
3/8"	0.68	0.94	0.08
1/2"	0.85	1.13	0.09
3/4"	1.06	1.38	0.09
1"	1.33	1.69	0.09



## How to Order

**[ 8 ] - RSG - [ 316 ] [ B ]**

### Inner Ring

- B Buna-N
- V Fluoroelastomer FKM

### Outer Ring

- 316 316 stainless steel
- CS Carbon steel, zinc plated

### BSP Pipe Sizes

- 2 G 1/8" A
- 4 G 1/4" A
- 6 G 3/8" A
- 8 G 1/2" A
- 12 G 3/4" A
- 16 G 1" A

### FOR YOUR SAFETY

IT IS SOLELY THE RESPONSIBILITY OF THE SYSTEM DESIGNER AND USER TO SELECT PRODUCTS SUITABLE FOR THEIR SPECIFIC APPLICATION REQUIREMENTS AND TO ENSURE PROPER INSTALLATION, OPERATION AND MAINTENANCE OF THESE PRODUCTS. MATERIAL COMPATIBILITY, PRODUCT RATINGS AND APPLICATION DETAILS SHOULD BE CONSIDERED IN THE SELECTION. IMPROPER SELECTION OR USE OF PRODUCTS DESCRIBED HEREIN CAN CAUSE PERSONAL INJURY OR PROPERTY DAMAGE.

# HOKE GYROLOK® Assembly Instructions



## Initial setting of ferrules onto tubing or tube stub-ended fittings

### Sizes 1", 25mm and Smaller Manual Assembly

Use the following instructions when initially setting ferrules onto either tubing, or the tube stub end of certain fittings (e.g. adapters, port connectors, and reducers). Note that for tubing sizes above 1/2", or 12mm, the use of a presetting tool, either manual or hydraulic, may apply. See further details in the Section titled, "Presetting Tool Assembly".

- Loosen the fitting nut.
- Firmly insert the tubing into the fitting assembly. Proper assembly requires the tubing be fully bottomed in the fitting body. (Note: Use of the HOKE Gyrogage or GMT, explained below, will allow the assembler to confirm proper tube insertion.)
- Establish a consistent starting point for wrench-tightening.
  - For applications using **Brass, Stainless Steel, or Monel** fittings:
    - For fittings that are under 1/2" (12 mm), finger-tightening of the nut is sufficient.
    - For fittings that are 1/2" (12 mm) and above, tighten the nut until a tube-tight condition is achieved. Tube tight is defined as the point beginning where the tube will no longer rotate and has zero axial movement. If it is not possible to determine if the tube-tight condition has been met then, while supporting the body with a backup wrench, use a wrench to tighten the fitting nut an additional 1/4 turn past finger-tight.
    - SEVERE APPLICATION WARNING:** For applications requiring high pressure, high safety factor or severe service, a tube tight condition is required irrespective of fitting size.

For applications using superior alloy (**Hastelloy C-276, Duplex 2205, Inconel, Super Duplex 2507, Titanium, 254 SMO**) fittings:

- For fittings that are under 3/8" (10 mm), finger-tightening of the nut is sufficient.
  - For fittings that are 3/8" (10 mm) and above, the fitting nut must be tightened until a tube-tight condition is reached. If it is not possible to determine if the tube-tight condition has been met, then, while supporting the body with a backup wrench, use a wrench to tighten the fitting nut and additional 1/4 turn past finger-tight.
  - SEVERE APPLICATION WARNING:** For applications requiring high pressure, high safety factor or severe service, a tube tight condition is required irrespective of fitting size.
- Mark both the fitting body and nut at the 12:00 position with a readily visible marking.
  - While supporting the body with a backup wrench, tighten the nut with a wrench 1 1/4 turns by going completely around past the 12:00 position to the 3:00 position. Note, when a Gyrogage or GMT is used, completely follow the appropriate usage instructions and then confirm that the mark on the tubing is visible at the back of the nut.

### Presetting Tool Assembly

Due to the inherent strength of large diameter heavy wall tubing, HOKE recommends the use of a presetting tool, either manual or hydraulic, for all installations involving tubing sizes from 5/8" or 16mm and above, regardless of application. When the tubing wall thickness being utilized in sizes less than 0.065" or 2.0 mm, a manual presetting tool is sufficient. When the wall thickness is 0.065" or 2.0 mm and greater, the use of a hydraulic presetting tool is specifically required. Each Hydraulic Pre-setting Tool is supplied with its own set of instruction.

The use of manual presetting tools is also suggested for smaller size fittings and tubing when the actual installation is in a hard-to-reach location, making it difficult to count turns. Use manual presetting tools by following the instructions for initially setting ferrules. By presetting the ferrules in the presetting tool, installation in place simply requires following **GYROLOK®** remake instructions.

### Remaking a fitting end, or assembling a fitting body to tubing with preset-ferrules

- Firmly insert the end with the previously set ferrules into the fitting body and tighten the nut to a finger tight condition.
- While supporting the body with a backup wrench, tighten the nut with a wrench until a sharp rise in torque is felt, then simply snug tight.

### Sizes 1 1/4", 28mm and larger

A Hydraulic Pre-setting Tool *must be used* when assembling 1 1/4", 1 1/2", 2", 28 mm, 30 mm, 32 mm & 38 mm **GYROLOK®** Tube Fittings

- A Hydraulic Pre-setting Tool is designed to set the ferrules on the tubing prior to installation into a fitting body. Each Hydraulic Pre-setting Tool is supplied with its own set of instructions.
- Prior to installation into the fitting body, lubricate the backside of the rear ferrule and threads on the nut with the lubricant supplied.
- Using the lubricant supplied, periodically lubricate the cone angle and threads of the Pre-setting Tool die-set (prior to first fitting make-up and approximately every fifth fitting thereafter).
- Insert tubing with preset ferrules into **GYROLOK®** body, hand tighten the nut, while supporting the body with a backup wrench, further tighten the nut with a wrench until a sharp rise in torque is felt.

### Remake Instructions:

- Firmly insert the end with the previously set ferrules into the fitting body and tighten the nut to a finger tight condition.
- While supporting the body with a backup wrench, tighten the nut with a wrench until a sharp rise in torque is felt, then simply snug tight.

When initially assembling the pre-set ferrule end of over 1", 25mm **GYROLOK®** adapters, follow the **remake instructions** listed above.

### All Sizes

#### Installations that do not involve setting of ferrules

Assembly instructions differ when installing fitting ends that do not involve setting ferrules, such as a plug (P), or the machined ferrule end of a port connector (PC), as well as for threaded ends such as NPT or SAE, for which appropriate standards should be used.

#### When assembling a GYROLOK® plug onto a GYROLOK® body:

- Remove nut and ferrules from fitting body.
- Place plug assembly onto fitting body. Tighten plug nut to a hand-tight condition.
- While supporting fitting body with a backup wrench, tighten plug nut with a wrench until a sharp rise in torque is felt, (approximately 1/4-turn on initial makeup, less on reconnections) then simply snug.

#### When initially assembling the machined ferrule end of a GYROLOK® port connector:

- Remove nut and ferrules from a fitting body.
- Firmly insert machined ferrule end of port connector into fitting body.
- Slide nut over tube stub end of port connector and then over machined ferrule. Hand-thread onto fitting body.
- While supporting fitting body with a backup wrench, tighten nut with a wrench until a sharp rise in torque is felt (approximately 1/4-turn on initial makeup, less on reconnections), then simply snug.

#### HOKE Gyrogage® Assembly and Inspection Tool

Use the HOKE Gyrogage® to perform step-by-step inspections during the initial assembly process. Each Gyrogage® is supplied with instructions, allowing the user to:

- Verify all components are present.
- Ensure proper insertion of the tubing into the fitting.
- Confirm sufficient tightening of the fitting nut.





**Gas Service**

Gases (air, hydrogen, nitrogen, etc.) can escape through smaller leak paths than liquids. As such, the reduction of surface defects (scratches) on tubing becomes more important when the system media contains gases. As tubing wall thickness increases, the ability of the ferrules to coin out imperfections increases. The use of heavier wall tubing will help the ferrules to overcome minor surface defects that could contribute to gas leakage. HOKE recommends the following minimum wall thickness for tubing when system media contains gases.

Tube OD (inches)	Nominal Minimum Wall Thickness (inches)	Tube OD (inches)	Nominal Minimum Wall Thickness (inches)
1/8	0.028	3/4	0.065
3/16	0.028	7/8	0.083
1/4	0.028	1	0.083
5/16	0.035	1 1/4	0.109
3/8	0.035	1 1/2	0.134
1/2	0.049 2		0.180



**HOKE Cares About Your Safety**

**WARNING**

*Improper selection or use of products described herein can cause Personal injury or property damage*



Product information described herein is offered for use by the system designer and user.

It is solely the responsibility of the system designer and user to select products suitable for their specific application requirements and to ensure proper installation, operation and maintenance of these products. Material compatibility, product ratings, and application details should be considered in the selection.

Always contact your local HOKE Distributor with any questions you may have before pressurizing and operating the product.

**SAFETY INSTRUCTIONS**

1. Do not tighten or loosen any part of a fitting or valve when the system is pressurized. Make sure the system is un-pressurized when tightening or loosening a fitting or valve connection.
2. Do not loosen HOKE **GYROLOK**® nut or any product component in order to relieve or bleed down system pressure.
3. Do not exceed pressure-temperature specifications stated in the appropriate catalog.
4. When the application involves use of a toxic or hazardous fluid, exercise extra caution during operation and maintenance.
5. Before assembling new, unused HOKE **GYROLOK**® tube fitting ends, loosen the HOKE **GYROLOK**® nut before inserting the tube to allow full insertion of the tube to the base of the body bore.
6. Always use tubing that is compatible with the fitting or valve material. Tubing appropriate for use with HOKE products is described in Tubing Data Charts. For example, use 316 Stainless Steel fittings with 316 Stainless Steel tubing.
7. Always leave a length of straight tube between the tube bend and the fitting. A tube bent too close to the fitting connection may be a source of leakage.
8. During assembly of the HOKE **GYROLOK**® tube end, always hold the fitting or valve body with one wrench while separately wrench tightening the HOKE **GYROLOK**® nut. Follow the same precaution when disassembling.
9. Always use a HOKE tube insert (basic part number "TI" when assembling a HOKE **GYROLOK**® fitting to soft, pliable plastic tubing.
10. Always use proper thread lubricants or sealants on tapered pipe threads. Note that thread sealants may have lower temperature ratings than the basic fitting.
11. When installing an NPT ended valve, hold the valve body near the connection with one wrench, while separately wrench tightening the mating pipe. Turn the pipe, not the valve. Follow the same precaution when disconnecting.
12. Do not hold the valve handle when tightening an end connection.
13. Do not use excessive force to open or close a ball valve e.g. do not use a handle extension.
14. On initial installation, valves may require an adjustment of the packing nut due to storage variations, systems parameters, and cold flow properties of TFE.

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www.hoke.com

**The Issue of Interchangeability**

Yes, you can interchange. Believe it. We guarantee the functional Interchangeability of HOKE **GYROLOK**® fittings with similar fittings of certain other manufacturers, including Swagelok®, Parker A-LOK®, and Parker CPT™.

You can interchange fittings either by using a complete HOKE **GYROLOK**® nut and ferrule system with a fitting body from certain other manufacturers, or vice vers. HOKE guarantees such interchanged fittings for a safe, secure, leak-tight seal, provided there is no deficiency in parts not supplied by HOKE. The properly interchanged product is covered by our standard warranty. For more information, ask your HOKE distributor.

# **CIRCOR**

INSTRUMENTATION TECHNOLOGIES



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